1ST NATIONAL CONFERENCE OF WOMEN IN TECHNICAL EDUCATION AND EMPLOYMENT (WITED), ILARO CHAPTER

THEME: WOMEN IN STEM (SCIENCE, ENGINEERING, TECHNOLOGY AND MANAGEMENT): REVAMPING TVET FOR ECONOMIC GROWTH AND SUSTAINABLE DEVELOPMENT

THE FEDERAL POLYTECHNIC, ILARO
OGUN STATE, NIGERIA

INTERNATIONAL CONFERENCE CENTRE (ICC)

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Jumoke Soyemi, PhD
Chairman, Conference Steering Committee
PREFACE

This is the proceeding of the 1\textsuperscript{st} National Conference of Women in Technical Education and Employment (WITED), Ilaro Chapter, Federal Polytechnic, Ilaro. The theme of the Conference is "Women In STEM (Science, Engineering, Technology And Management): Revamping TVET For Economic Growth And Sustainable Development".

We received over 100 papers cut across different fields and paper submitted were both from outside and within the Institution. All the papers were sent out to reviewers and reviewed papers were sent back to authors before the final submission of the corrected copies. We appreciate the efforts of the reviewers, for their commitment and promptness. It would have been impossible to achieve the goal of making proceedings available in this conference without them. The quality of these papers is a pride to the authors and the reviewers who provided relevant guide for the improvement.

The Conference and the Conference papers appearing in proceedings have only been made possible by our great Pillar (Arc. O.O. Aluko) who believed in us – Women and supported us from the beginning to the end. Words fail us and we cannot thank you enough. The former Rector, Dr. R.A. Oloyo who made available his wealth of knowledge from time to time, you are a great mentor. The management team, Academic Board Members (Male), WITED members, WITED Executives, the Conference Steering Committee and Sub-committees and all the sponsors, you are all appreciated for bringing this conference to a reality.

We wish all the participants a fruitful deliberation and a pleasant stay in the Gateway state for participants from other states.

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ABSTRACT

The advancement and sustainability of any nation depends on science and technology. Over the years, women are seen to have improved in their quota of contributing to nation building and development, however, their participation in science and technology is very low compared to their male counterparts. A major cause of this has been traced to mode of curriculum content delivery in science and technology-based courses. This paper, therefore developed a teaching framework that fosters female participation in science and technology through enhanced curriculum delivery using Information Technology. Statistical analysis was further conducted through quantitative research that administered questionnaires to 50 participants each from the 7 departments in the school of Management Studies of the Federal Polytechnic Ilaro, totaling 350 participants, to seek the reason behind the student’s choice of courses into management studies and not Science and Technology based courses. Out of the research instruments administered for the research study, 91.1% was returned in which the analysis was based upon. Analysis was done using descriptive statistics. The result from this analysis indicated that 49.2% avoided Science and Technology based courses because of the mode of curriculum content delivery that made the courses look difficult, 23.8% avoided it because of their belief that science based courses are difficult, 16.9% have passion for Management courses while 10% just found themselves studying Management courses because of issues with their WAEC result combination. This research study recommends that the curriculum should be enhanced using Information Technology as the driving tool to increase female participation in STEM courses.

KEYWORDS: Science and Technology, Growth and Development, Improved Curriculum Content Delivery, Information Technology

1. INTRODUCTION

Education is central to any nation’s growth and development and according to Nyerere (1968), Education is an instrument that prepares an individual for life and must foster social goals as well as encourage the growth of social attitudes and values. Therefore, a country that must develop and be productive must strive to educate its citizens including the female gender. The culture of marginalization and discrimination of female gender in education had persisted until now, determining, the kind of courses to run if eventually given opportunity to attend higher institution and the type of jobs that could be picked up by them. Presently, there have been great improvement leading to many female’s admission into higher institutions. However, the percentage of such admission into Science and Technology based courses are quite poor.

Science and Technology are the secret behind economic growth and development through scientific discoveries and technological innovations. Statistics has it that women participation in Science and Technological education is far low compared to their male counterparts (Wang & Degol, 2018). Most of them study courses that tends towards the so-called ‘women occupation’ such as secretariat jobs, nursing, teaching and social works. Courses in Science and Technology such as Engineering, Medicine, Mathematics, Physics are dreaded by most female gender. According to world population statistics by United Nations (2017), put the estimate of male population as 3,776,294,273 and that of female population as 3,710,295. This high population of women, therefore requires strategies to be developed so as to encourage more participations of the gender in science and technology-based courses for sustainable economic growth and development.

The conventional way of lecture delivery to students of nowadays are no longer interesting and attractive enough to command their interest and attention. The advancement in Technology and the world of Information Technology (IT) has turned the world into a global village and changed several ways of carrying out assignments from the traditional to the modern way. The advent of multimedia devices, smart phones coupled with the internet has widen the scope and imagination and means of getting required information by students. In western world, it is no longer popular to engage students in teaching and learning through the conventional methods alone. Here, in Nigeria, curriculum delivery at all levels in schools have not yet metamorphosized into the present age. There is the need to enhance the present curriculum delivery to attract
female gender participation in science and technology-based courses for the future growth and development of the nation having in mind that the female’s population far outnumbered those of the male population.

When formal education was introduced initially in the past by religious, missionaries and colonial powers, females were not permitted to attend schools until much later. Despite this, the number attending school were much less compared to their male counterparts (Allison et al., 2008; Masanja, 2010). According to Masanja (2010), the culture of marginalization and discrimination of females in education continued until recently and the stereotype knowledge and skills given to females at the introduction of formal education continues to affect the gendered nature of education today and hence determines the courses for females. They continue to be underrepresented in the careers related to Science and Technology (Cheryan, Master & Meltzoff, 2015).

This study developed a teaching framework that takes the advantage of Information technology as the enhancement tool to deliver curriculum in an attractive way that makes Science and Technology based courses attractive to the female gender. The study also carried out a survey to understand the perspectives of female students that finds themselves in the non-science and technology-based courses.

2. RELATED STUDIES

The effect of using computer on 6th grade primary school students were considered by Atawaim (2000) to determine the effect of computer use as an educational tool on students’ academic performance. This study revealed significance statistical differences in students’ average difference in the level of academic performance and the overall test level.

The effect of using computer as an educational tool in teaching the curriculum of statistics on the development of statistical skills among the third-grade secondary school students was investigated by Salem (2000). Here, experimental group were taught using the computer and the control group was taught using the traditional method. The study showed significant statistical differences in the average grades of the experimental and control groups in favour of the experimental group.

Effectiveness of the use of multimedia computer technology in teaching Geometry to the third preparatory grade students on students’ academic achievement and the development of innovative thinking was carried out by Nasr (2005). The result obtained from the experimental and control group set up revealed a statistical significance difference in their grades to favour the method of teaching that used interactive multimedia instead of traditional method.

The effect of using Mathematics software produces locally on the second grade intermediate female students’ academic achievement in Riyadh was conducted by Da’lij (2008) to identify the use of multimedia software produced locally on second grade intermediate female students’ academic attainment in mathematics. The statistical result between the experimental and the control shows no significance difference using the traditional method and interactive multimedia technology.

The impact of using multimedia on students’ academic achievement in College of Education at King Saud University was conducted by Aloraini (2012) to find out the influence of using multimedia in teaching computer and its uses in education on the female students’ academic achievement. The study discovered that more academic successes were recorded using multimedia in presenting computer lessons than the traditional method of teaching.

The study by Soyemi, Ogunyinka and Soyemi (2012) proposed the use of self-paced e-learning with conventional classroom learning since ICT use in the classroom have a way of increasing and motivating student towards learning. The authors believed that taking the advantage of both methods of teaching and learning will impact positively and improve academic performances of the students at large.

Study by Meluso, Zheng, Spires & Lester (2012) carried out a study on ‘Enhancing 5th graders science content knowledge and self-efficacy through game-based learning’. Despite the fact that many argued that games can positively impact learning by producing an intrinsically motivating and engaging learning environment for students than traditional means, the investigation from this study indicated that there were no difference between collaborative and single game player conditions on science content learning and science self-efficacy. The study however proposed that future research should focus on the composition of collaboration interaction among game players to assess what types of collaborative tasks may yield positive learning gains.

A game-based learning approach to increase female participation in science, technology, engineering and mathematics fields was carried out by Bonner (2015). This study developed a game that teaches the concept of variables, lists and if-statements and this game was assessed using middle class students. The essence of this assessment was to determine whether the educational game developed is effective and attractive to the female gender in teaching basic computer programming concepts. The outcome of this assessment revealed increase in students’ comprehension of programming concept from the
pre-experimental assessment. Students indicated increased likelihood to pursue a career in a programming related profession after playing attractive games.

The effects of integrating mobile devices with teaching and learning on students’ learning performance: A meta-analysis and research synthesis was implemented by Sung, Chang & Liu (2015). Analysis of the empirical research on the use of mobile devices as tools in educational interventions revealed that the overall effect of using mobile devices in education is better than when using desktop computers or not using mobile devices as an intervention, with a moderate effect size of 0.523.

3. PROPOSED FRAMEWORK

Figure 1 is the proposed framework for teaching and learning in this study. Resources for learning are to be made available in both hard and soft copy. The advantage of e-books should also be engaged having in mind that apart from visiting the institutional e-library, virtually all students have access to internet enabled cell phones. This means that the learning process for the student can be made ubiquitous if proper use of the phones is employed. Next is the content delivery using multimedia, pictures, diagrams, games and many more. Learning has moved beyond the traditional method to more involving and attractive methods that engages the interest of the student throughout the learning process. Beyond just muttering words in the classroom and creating imaginary pictures that may or may not be comprehensible by the students, teachings that get the attention of students is now delivered using real pictures, diagrams, graphs, games to illustrate and drive home the points. This method ensures permanent retentivity on the student’s part and makes learning more simplified.

Aside from the classroom teaching using Multi-Media Pictures/Diagrams/Games content delivery, self-paced study is very important so as to complement the efforts of conventional classroom learning as proposed by Soyemi, Ogunyinka & Soyemi (2012) in their study ‘Integrating self-paced e-learning with conventional classroom learning in Nigeria Educational System’. Therefore, the self-study can be achieved through self-paced e-learning or by taking the advantage of the cell phones using educational resources available, such as educational mobile apps or recordings done during lectures that could be played all over again at the students pace in order to catch up with missing points in the classroom. Although, Soyemi, Oloruntoba, & Okafor (2015) discovered in their study that mobile phone is a source of distraction to students and contributes to poor academic performance in tertiary institutions if not put to properly use. Here, the strength of mobile phone is put to use to enhance the support needed for self-study to complement the content delivery in the classroom using Information Technology (Multi-Media Pictures/Diagrams/Games).

The combination of the above in teaching and learning would lead to the next stage which is more enrolment of females in Science and Technology based courses in addition to better academic performances. The above framework proposed the use of what the students enjoy using most, to pass across the needful. This is taking the advantage of content delivery using Information Technology to foster female participation in science and Technology based courses. Simplicity of delivery, attraction through what they are familiar with to deliver the content, delivery that is pictorial, graphical, multimedia empowered, video and games are therefore the key to improve the participation of the female gender.
4. METHODS

4.1 Data Collection Method

Survey method was adopted in carrying out this research study. The surveyed data used was collected through structured questionnaire. The questionnaire was administered to a sample of 350 female students aged 16 – 27 in the seven(7) departments of the school of management studies, Federal Polytechnic, Ilaro out of which 91.1% of the research instrument was returned. A self-administered process whereby the respondent himself reads the questions and records answer without the assistance of an interviewer. The questionnaire was designed to collect relevant information the questions were numbered for easy references and arranged so that the respondents can understand easily the reason and important attached to each question. The form of questionnaire used provided an easy quick way of collecting objective information from primary sources without necessary allowing the respondents to strain his or her brain for answers.
4.2 Method of Data Analysis
Descriptive Statistics method of data analysis was applied to scale and unscaled statements to examine the order of importance. The analysis was done using Statistical Package for Social Sciences (SPSS) Version 20.

5. RESULTS AND DISCUSSION
The figure 2 below is the distribution of the seven Departments in the School of Management studies. Eighty percent of the questionnaires were returned (280). Department of Taxation has the least number of participants (10%) while department of insurance has the majority number (16%) as shown in figure 2. Department of Public Administration, Business Administration, Accounting and Banking & Finance have the same number of participants indicating 15% each, while the Department of Marketing has 14%.

![Figure 2: Distribution of Participants Departments in the School of Management Studies](image)

Table 1 depicts the satisfaction of female students in non-STEM courses based on their chosen field of study. However, 50.5% of the participants were not satisfied with their choice of courses irrespective of the departments they found themselves while 49.5% were satisfied. Analysis revealed that responses vary from participants to participants on whether they are satisfied with their chosen course of study taking the departments into consideration as depicted in figure 3.
### Table 1: Frequency and Percentage distribution of Participants on satisfactory level of course choice and their chosen course of study

<table>
<thead>
<tr>
<th>Departments</th>
<th>Count</th>
<th>No</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>20</td>
<td>27</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% within Department</td>
<td>42.6%</td>
<td>57.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Banking and Finance</td>
<td>25</td>
<td>24</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% within Department</td>
<td>51.0%</td>
<td>49.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Bus. Admin</td>
<td>30</td>
<td>17</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% within Department</td>
<td>63.8%</td>
<td>36.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Insurance</td>
<td>27</td>
<td>23</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% within Department</td>
<td>54.0%</td>
<td>46.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Marketing</td>
<td>21</td>
<td>25</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% within Department</td>
<td>45.7%</td>
<td>54.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Public Admin</td>
<td>26</td>
<td>21</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% within Department</td>
<td>55.3%</td>
<td>44.7%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Taxation</td>
<td>12</td>
<td>21</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% within Department</td>
<td>36.4%</td>
<td>63.6%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>161</td>
<td>158</td>
<td>319</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% within Department</td>
<td>50.5%</td>
<td>49.5%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

*Source: Field Survey, 2019*

---

It can be evidenced from figure 4 that majority of the female students representing 157(49.2%) said that mode of curriculum content delivery resulted in their avoidance of science based courses, 23.8% attributed the reason to the difficulty associated with science-based courses, 16.9% said management courses were their preference from onset and never STEM related courses while 10% of them attributed the reason to their O’level combinations that made it impossible to opt for STEM courses.
Figure 4: Bar Chart showing female students’ distribution on avoidance of science-based courses.

Table 2 is the weighted score of respondents that depicts that the participants agreed on a weighted average of 4.14 that the choice of course is influenced by the mode of curriculum content delivery which made the foundation courses look difficult; they also agreed that multimedia and interactive lecture delivery is the required IT means to make science and technology based courses attractive to them as analyzed on the weighted average of 4.21. In addition, the participants agreed on the fact that poor foundation and dislikes for Mathematics is the root cause of their challenges in science and technology-based courses but were neutral on whether female students choice of course is influenced by cultural beliefs. Participants also opined that enhancing curriculum content delivery by making it attractive and interesting using IT will increase female participation in science and technology-based courses.

Table 2: Weighted Average on Perception and Remedial measures of female participation in STEM courses.

<table>
<thead>
<tr>
<th>Choice of course is influenced by the mode of curriculum content delivery that made the foundation courses look difficult</th>
<th>SD</th>
<th>D</th>
<th>U</th>
<th>A</th>
<th>SA</th>
<th>WF</th>
<th>WA</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>8</td>
<td>42</td>
<td>147</td>
<td>117</td>
<td>1320</td>
<td></td>
<td>4.14</td>
</tr>
<tr>
<td>Multimedia and Interactive lecture delivery is the required IT means to make Science and Technology based courses attractive to Female students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>0</td>
<td>16</td>
<td>199</td>
<td>99</td>
<td>1344</td>
<td></td>
<td>4.21</td>
</tr>
<tr>
<td>Poor foundation and dislikes in Mathematics is the root cause of Female students having challenges in Science and Technology based courses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>12</td>
<td>34</td>
<td>139</td>
<td>130</td>
<td>1336</td>
<td></td>
<td>4.19</td>
</tr>
<tr>
<td>Female students’ choice of course is influenced by cultural beliefs that they should be limited to certain courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>149</td>
<td>8</td>
<td>8</td>
<td>99</td>
<td>904</td>
<td></td>
<td>2.8</td>
</tr>
<tr>
<td>Enhancing curriculum mode of delivery by making it attractive and interesting using Information Technology will increase Female participation in Science and Technology based courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>39</td>
<td>54</td>
<td>91</td>
<td>106</td>
<td>1163</td>
<td></td>
<td>3.65</td>
</tr>
</tbody>
</table>

Source: Author’s Computation
Results presented as number of participants. Perception and remedial measures was scored by giving 1 to SD, 2 to D, 3 to U, 4 to A, and 5 to SD. Reversed questions were coded otherwise.

Weighted Mean intervals and decision rules on Likert Scale
Strongly Agree (SA) = 4.5 - 5.0; Agree (A) = 3.5 - 4.4; Undecided (U) = 2.5 - 3.4
Disagree (D) = 1.5 - 2.4; Strongly Disagree (SD) = <1.5
WF = Weighted Frequency; WM = Weighted Mean
6. CONCLUSION

This paper has clearly shown that there is the need to change the mode of curriculum delivery using Information Technology to foster female participation in Science and Technology based courses. Teaching and Learning has moved beyond the traditional method to more involving and attractive methods that engages the interest of the student throughout the learning process. The statistical analysis from this study also supports the fact that female participation will be better improved in science and technology-based courses if the various mode of curriculum content delivery is revamped. The framework proposed in this study used multimedia, pictures, diagrams, games and many more for content delivery.

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ABSTRACT
With the trend in development of the nation, it is eminent that information technology (IT) plays a vital role in alleviating unemployment, innovations and sustaining socio-economic development. Software development is a key player in the IT sector of the society, which helps in providing solutions to problems faced by the economy. Researches over years have proved that women are more than men, especially in developing nations. This study focuses on the factors responsible for gender difference in programming. A quantitative research was carried out, data collected using questionnaire, data analysed using statistical tools such as Statistical Packages for Social Sciences (SPSS), and the results were presented using tables and chart. It was observed that the involvement of gender in programming has little or nothing to do with the gender status, rather the interest and passion of individuals. It is therefore recommended that educational planners and policy makers in developing nations should introduce measures of building the interest of the students from secondary level.

KEYWORDS: Programming, software development, socio-economic development, gender difference

1 INTRODUCTION
Computer programming is the process of designing and building an executable computer program for accomplishing a specific computing task. Programming involves tasks such as analysis, generating algorithms, profiling algorithms' accuracy and resource consumption, and the implementation of algorithms in a chosen programming language (commonly referred to as coding). The purpose of programming is to find a sequence of instructions that will automate the performance of a task (which can be as complex as an operating system) on a computer, often for solving a given problem. (Wikipedia).

In developing nations, most females view the act of writing computer program as a difficult task, which is the contrary when compared with the past. In the history of computer programming, feminine gender has played a vital role and have contributed immensely to the development of the field of computer science and Information Technology (IT). A London-born Ada Lovelace (1815-1852) had a passion and gift for mathematics from a young age. She was credited with being the world’s first computer programmer, as she drafted a plan for how a machine called the Analytical Engine could perform computations. The machine, invented by her friend, mathematician and inventor Charles Babbage, is considered to be the first general computer. Lovelace detailed applications for the Analytical Engine that relate to how computers are used today (Purdue global, 2018).

Also, Grace Murray Hopper, (1906-1992) was an American computer scientist and United States Navy rear admiral. She was considered to be one of the first programmers of Harvard Mark I the computer, inventor of the first linkers. Also, made accessible the idea of machine-independent programming languages, which later led to the development of the Common Business Oriented Language (COBOL) an early high-level programming language, released in the early 1960s. These women are notable for their contribution to the field of computer programming.

According to the statistics from women who code, women hold 24% of jobs in the United States. That number is expected to decline if no one makes an effort to educate and involve more women in coding.
and developing software programs and operating systems. Throughout the 19th century and early 20th century and up to the world war II, programming was predominantly done by women, significant examples include the Harvard computers code-breaking at Bletchley Park and Engineering at NASA.

According to data compiled by virtual event solutions company, Eva, women make up less than 20% of the US Tech job, even though they make up more than half of the US workforce. Even worse, women now hold a lower share of Computer Science jobs than they did in the 1980s. This is surprising because unemployment across tech positions in 2016 at 2.5% was significantly lower than the 4.9% national average. In 1960, 65% of United States citizens’ estimated

2000 computer programmers were women (Lookhed, 1993). US Department of Labour, Bureau of Labor Statistics stated as, at 2012, computer programming is a field dominated by men with women making up 22.5% of computer programmers worldwide. **Objectives of the study**

This research study aims at testing for the effect of the supposed factors responsible for the gender difference in programming. Using some variables: age range, gender, interest, programming skills and marital status.

**Problem statement**

Women have been poorly represented in the field of Computer Science, most especially computer programming. In this technology age that we are, most of the major contribution we have had have been coming from men.

Consequently, the nation’s potentials have been underutilized because woman population is higher than men. If they are more involved, we have more innovations springing up as a result of the massive contributions from both genders.

**2.0 RELATED WORKS**

Women have been said to be poorly represented in computing most especially in computer programming. However, there is a dearth of empirical research to support this evidence. Akinola, (2015) in his study, employed an experimental proof approach to verify the wide acclaimed gender difference in computing. Two parallel student-gender groups (male and Female) were subjected to two different computer programming problems. The problems were given to them to solve, starting from the analysis phase to the final implementation. Their outcomes measured in terms of the accuracy and efficiency of codes turned out from the experiments, were compared statistically.

Briefly, the results showed that gender difference may not come into play at all when it comes to computer programming. Other factors like fear, interest or attitudes may, however, be responsible for the low representation of females in computing. Students’ self-efficacy perception levels do not differ with respect to gender(Korkmaz, Altun, 2014).

Humphrey, 1999; Brooks, 1995; Boehm, 1981 were of the opinion that learning process of programming skills might be investigated into two main perspectives. The first is the professional software engineering perspective, which aims to undertake big projects requiring a complete competence and synchronized teamwork. On the other hand, the pedagogical perspective is focused on acquiring individual programming skill in a well-defined, limited-scope of framework. In summary, it was believed that the well researched gender difference in risk perception and acceptance is significant for a variety of reasons. First, accepting risks may be perceived as an indicator of confidence, and perhaps, competence. Thus, within the context of programming contests, women may
be perceived as less competent because they adopt less risky approaches. This matter is even more deleterious, given that stereotypical beliefs, such as “people view me as less competent because I am female” often lead directly to depressed performance [SA95]. Second, rather than gambling on their ability to guess the correct approach, women will take more time to explore one solution as opposed to implementing a “fast and dirty” solution that may not work. This less risky strategy will allow less time for trying a wider assortment of potential solutions, and less time to attempt remaining questions. Third, women will not guess at a response as readily as men, nor direct team mates to consider a possible solution, when they are not sure of themselves. They will also feel uncomfortable when, in a mixed-sex team, they are asked to pursue high-risk strategies (Fisher and Cox, 2006). Anxiety can play important role in gender computer programming. As cited by (Akinola, 2015) Women experience a decrease in self-confidence when they perceive that their work will be compared to others for evaluation (Lenney, 1997).

Hence, previous work shows that gender is the main reason for gender difference.

3.0 RESEARCH METHODOLOGY
In this research work, quantitative approach was used to determine the most pinning factors responsible for gender difference in programming, some variables such as gender, marital status, and interest were analysed.

3.1 Subject
Questionnaires were administered to student of Computer Science Department, considering their levels. Students in their first year (ND1) have been voluntarily taken out of consideration, since we believe that they are still new to the field and could be biased in their judgement with respect to the questions that they were being asked. So, 100 students were selected randomly from ND2 (second year), HND I (third year) and HND II (Forth Year). These level are expected to be sincere in their response to the questions.

3.2 Questionnaire Design
In the questionnaire design, those student were asked questions such as: Age group, Gender, Marital status, their level of performance in programming courses, factors they thought were responsible for gender difference in programming, their level of performance in programming courses, do they think programming is difficult as a career, do they desire to be a programmer and their interest in programming as a profession.

3.3 Performance Evaluation
This was done making use of percentage ratio which was analysed using SPSS (Statistical Packages for Social Sciences).

FORMULA

\[
\frac{x}{n} \times 100 = p
\]

where:

- \(x\) = given quantity
- \(n\) = total amount
- \(p\) = percentage of the quantity compared to the total
4.0 RESULTS AND DISCUSSION

4.1 Results

The result from this study was presented making use of tables and charts: Below are some of the results analysed.

4.1.1 Opinion of respondents on the gender participation in programming

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Only</td>
<td>8</td>
<td>8.0</td>
<td>8.0</td>
<td>8.0</td>
</tr>
<tr>
<td>Female Only</td>
<td>3</td>
<td>3.0</td>
<td>3.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Both</td>
<td>89</td>
<td>89.0</td>
<td>89.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 1: Gender Participation in Programming

4.1 Discussion

From the above table, the data clearly depicts that 8% of the respondents believe that programming is meant for the male gender alone, 3% of the respondents from their response believe that programming should be meant for the female gender alone. Whereas 89% of them believe that programming should be meant for both genders. With this fact, the output suggests that programming should be meant for both gender.
The result suggests that the interest of students in programming is the most important factor responsible for the gender difference. From the respondents, 80% believes that interest is the major factor responsible for gender difference, 16% believed that career is the responsible factor, while only 4% believes that marital status is responsible for the present gender difference in programming. From this fact, it can be concluded that interest is the most-pinning factor responsible for gender interest in programming.

4.1.3. Opinion on Programming as a difficult career

Table 3: Is programming as a career difficult

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>23</td>
<td>23.0</td>
<td>23.0</td>
<td>23.0</td>
</tr>
<tr>
<td>No</td>
<td>41</td>
<td>41.0</td>
<td>41.0</td>
<td>64.0</td>
</tr>
<tr>
<td>Undecided</td>
<td>36</td>
<td>36.0</td>
<td>36.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
DISCUSSION
This outcome of the analysis of the data gathered suggests that programming is not a difficult career, 41% believed that programming is not a difficult career, 23% of the respondent believe it to be a difficult career. While the other 36% picks none of the two options above.

4.1.4 Evaluation of student’s performance in programming courses

Table 4: level of performance In Programming

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>13</td>
<td>13.0</td>
<td>13.0</td>
<td>13.0</td>
</tr>
<tr>
<td>Low</td>
<td>30</td>
<td>30.0</td>
<td>30.0</td>
<td>43.0</td>
</tr>
<tr>
<td>Average</td>
<td>57</td>
<td>57.0</td>
<td>57.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4: A chart showing level of Performance in Programming
The level of performance of respondents was also considered. Most of the respondents’ performance in programming is average with 57%, those with low performance with 30%, while those with high performance in their programming course are just 13%. This analysis suggests that most of the students are average in their programming courses.

4.1.5 opinion of students studying computer science to be a programmer

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>71</td>
<td>71.0</td>
<td>71.0</td>
<td>71.0</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>16.0</td>
<td>16.0</td>
<td>87.0</td>
</tr>
<tr>
<td>Undecided</td>
<td>13</td>
<td>13.0</td>
<td>13.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Figure 5: A Chart showing Respondent ambition

From the above analysis using percentage ratio, 71% of the considered respondent would like to take a career in Computer Programming. 16% considered No, 13% are still undecided.

4.2 Summary of the discussion

Summarily, Most of the students are average in their performance in programming, programming should be meant of both genders, the most responsible factor for gender difference is interest, most of the respondents are interested taking a career in programming, most of the respondent believe programming as a career is not difficult.
5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

An empirical research was carried out in this study to analyse the factors responsible for gender difference in programming. From this study it could be deduced that the gender of a prospecting programming student have little or no impart on the career of being a software developer, furthermore, it has been observed that the marital status of individual has little or no influence of this programming career. Hence, the eminent factor from this study is the interest of the individual.

5.2 Recommendation

This study hereby recommends that the interest and passion of the female gender should be aroused by concerned stakeholders to increase the participation of females in software development.

REFERENCES


10.1080/18117295.2018.1540169
ANTIMICROBIAL ACTIVITY OF AQUEOUS EXTRACT OF UNRIPE PAWPAW (Carica papaya Linn.) PEEL AGAINST ESCHERICHIA COLI AND BACILLUS SPP

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ABSTRACT
One of the common plant materials used in treatment of sickle cell disease in Nigeria is unripe papaya. This study examined the aqueous extracts of fresh (wet) unripe papaya peel for possible antimicrobial potencies and compared their antimicrobial property to those of standard antimicrobial drugs such as Ampicillin and Augmentin. Hot aqueous was used to extract phytochemicals from the peel of unripe Carica papaya to determine their antibacterial activities. The extract showed maximum zone of inhibition of 27mm, 30mm, against Escherichia coli and Bacillus spp respectively. However no zone of inhibition was seen for Ampicillin and Augmentin against Escherichia coli and Bacillus spp respectively. Based on our result, aqueous extract of unripe papaya peel as herbal materials could be of therapeutic use in the management/treatment of diseases caused by antibiotic resistant gram positive and gram negative bacteria.

Keywords: Unripe Carica papaya peel, Antimicrobial Properties, Agar well Diffusion, Ampicillin, Augmentin

1.0 INTRODUCTION
One of the most important issues of current medicine is bacterial drug resistance and uropathogenic tract infections and the primary factor of this issue are Uropathogenic Escherichia coli strains (Wioletta et al., 2017). Bacillus spp, due to their ability to stimulate the immune system are used for a range of different biotechnological applications, such as probiotic dietary supplements for humans and animal feed inoculants (Huang et al., 2008). However, there is an increasing public health concern about the possibility of microbial cultures used as dietary supplements or for food production being potential sources for the transfer of antibiotic resistance genes (Gevers, 2003). This concern is underlined by the fact that Bacillus spp. in a number of commercially available probiotic feed supplements for both humans and animals have been shown to be resistant to several antibiotics (Hoa, 2000). Because bacteria is promiscuous in nature, susceptible bacteria may acquire resistance genes from plasmids and other horizontally transferred genetic material, resulting in evolution by leaps which is the cause prevalence of antibiotic resistance (Higgins, 2007).

Papaya consumption has been recommended for preventing vitamin A deficiency which causes childhood blindness in many tropical and subtropical countries based on its accordance to the united states recommended daily allowance for many vitamins, (Guoado et al., 2007). Unripe papaya however is known for its therapeutic use as an antiseptic (Nwofia and Ojimelukwe, 2012). Report by Sade, 2010 has shown that aqueous extract of unripe pawpaw has no harmful effect on kidney functions. Extracts of agro-base wastes such as peels and seeds of fruits are being explored for their antibacterial activities since they are cheaper and could support the drive to reduce waste. (Ashok et al., 2011). Unripe pawpaw peel can be obtained during the preparation of the unripe fruit for meat tenderization (Maiti et al., 2008). Pharmacological properties of natural products are mostly evaluated using in vitro models (Abdulrazaq and Mohammad, 2015). Muhamad et al., 2017 states that reports on antibacterial activities from papaya (Carica papaya) peels are still scanty. The aim of the present research was to examine the antimicrobial activity of aqueous extract of fresh (wet) unripe pawpaw peel on Ecoli and Bacillus spp.

2.1 MATERIALS
Unripe pawpaw was obtained from local market. All chemicals and reagent used were of analytical grade

2.2 SAMPLE PREPARATION
The unripe pawpaw peels were removed using table knife, washed thoroughly with distilled water and diced into tiny pieces.
2.2.1 Extract Preparation

About 25g of the air-dried unripe pawpaw peel was put in a beaker containing 100ml distilled water and heated in a water bath at 60°C for 30min. The aqueous extracts were separated by filtration with Whatmann No. 1 filter paper (pore size 0.45 μm) and then centrifuged at 1000 rpm for 10 min (Abhay, and Rupa, 2016).

2.3 ASSESSMENT OF ANTIBACTERIAL PROPERTY

Antibacterial activity of aqueous extract of unripe pawpaw peel were tested against *Escherichia coli* (Gram negative bacteria) and *Bacillus spp* (Gram positive bacteria).

2.3.1 Test Pathogens

The bacterial strains employed in this work were obtained from the Molecular Biology Laboratory of Covenant University after proper identification by a certified Microbiologist.

2.3.2 Preparation of Sample for Antimicrobial Assay

The extract was kept in the oven at 60°C until it was completely dried (Gloria et al., 2017). The resultant dried extracts were dissolved in Phosphate Buffer Saline (PBS) to a concentration of 4.7g/mL extract solution.

2.3.3 Antibacterial Assay

The antimicrobial potency of the sample was checked using Agar well diffusion method as described by Abhay and Rupa, 2016 with appropriate modifications. In brief, Muller Hinton agar was poured into petri dishes. After solidification of nutrient agar plates, 20 μl of standardized inoculum of the test organism was seeded on respective plates and wells of 5mm diameter were bored using a cork borer. About 50 μl of extract was loaded into the wells. Plates were incubated at 37 ºC for 24hrs, and was inspected for Zone of inhibition. The zone of inhibition was compared with that formed by Standard antibiotics: Ampicillin and Augmentin (gram negative and positive antibacterial drugs) against *E.coli* and *Bacillus spp* respectively.

3.0 RESULT AND DISCUSSION

Increase in drug resistance bacteria is as a result of the use and over use of synthetic antibiotics (Llor and Bjerrum, 2014). Natural products such as medicinal plants are non-narcotic, having no side-effect and are easily available at the affordable price. (Verpoorte et al., 2002). Herbalism is the study and use of medicinal properties of plants and plant extracts. Herbal medicine is one of the readily available resources for primary health care system (Khan et al., 2012). Agro-base wastes such as peels and seeds of fruits are been explored for their antibacterial activities since they are cheaper and could support the drive to reduce waste (Ashok et al., 2011). In Nigeria, unripe papaya peel is usually discarded during the preparation of papaya fruit. This study therefore examined the aqueous extract of unripe pawpaw peel for its antimicrobial potency against *E.coli* and *Bacillus spp* and compared its activity to standard drugs viz; Ampicillin and Augmentin. The extract showed maximum zone of inhibition of 27mm, 30mm, against *Escherichia coli* and *Bacillus spp* respectively. However no zone of inhibition was seen for Ampicillin and Augmentin against *Echerichia coli* and *Bacillus spp* respectively.
**Figure 1:** Zone of inhibition of samples

FUPP - Fresh unripe pawpaw peel

### 4.0 CONCLUSION

Based on our result, aqueous extract of unripe papaya peel as herbal materials could be of therapeutic use in the management/treatment of diseases caused by antibiotic resistant gram positive and gram negative bacteria.

### REFERENCES


ROLES OF WOMEN IN TECHNOLOGICAL CHANGE, RESEARCH AND DEVELOPMENT

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ABSTRACT

Technological change, research and development are the three major things that build or develop a nation or society. This study aims at revealing the roles of women as related to the above subject matter. They play a major role in the society by combining their career with their domestic chores as wives and mothers, thereby neglecting their contribution to the development of the society or nation. Globally, the population of women is larger than that of men, thus, its impact cannot be overemphasized. This paper looks into the gender gap, its constraints and how to overcome them. Also, the effective roles of women in societal development were outlined and solutions and suggestions on how they can be fully involved in the ongoing technological change and societal development were presented. Thus, enhancing women interest in science and engineering could improve innovation and problem solving skills.

KEYWORDS: development, nation, society, technology, women

1 INTRODUCTION

Women play a major role in the society by combining their career with domestic chores as wives and mothers, thereby neglecting their contribution to the development of the society or nation. In some organizations, women find it difficult to gain employment due to several factors. Enhancing women’s interest in technology and research could bring about the development and innovation we all desire.

There are few women who study STEM (Science, Technology, Engineering and Mathematics) courses. However, employed women are few in the field of engineering and some employers do not even want to employ female. Recently, other nations are advancing in technological innovations and we on the other hand, are low on the global innovation index. According to a research, women make up 22% averagely of the total number of engineering and technology graduates yearly. Also, if care is not taken, most of the jobs in the decade will require good knowledge and technological skill. If women are not carried along, as technology developers and users, we might be lagging behind in future. (Women’s Technology Empowerment Center, 2016)

If Nigeria needs to attain a long lasting development, role of women in technological change, research and development should be a major concern by government for companies and civil society. Research shows that any nation or society that fails to harness the energy and creativity of its women is lagging behind in the modern day. Problems of low involvement seem to be developed from the lack of exposure of women to prospective careers in Technology, Engineering, Mathematics and other science related courses. Therefore, women should be encouraged to take part in STEM courses as soon as they get of age and thus ensure equal participation of both female and male students so as to promote career discovery right from a young age. (Women’s Technology Empowerment Center, 2016)

The profession of engineering is changing with less emphasis placed on the older heavy types of engineering. In its place are computers and chips, printed circuit boards, programming, design and electronics. Women in engineering are not dramatically different from women in the more traditionally feminine fields, or from their male engineer counter parts. Based on research, women did not seek or find career success for several factors. One was that the women learnt that high achievement might be a loss of their traditional feminity which was preferred, was thus preserved while achievement was sacrificed. There are no serious sex-related individual differences between women and men’s behavior at work. Lack of the opportunity to succeed and not a personality style shuns success; thus, separates the women from men. This study is aimed at revealing the relevance of women in Technology, Research and Development.
2 LITERATURE REVIEW

2.1 Gender Gap in Engineering

Women should be able to contribute to policies and decisions on issues that affect them. That seeks to address women’s challenges in contribution to policies and decisions but fail to do so effectively because they were designed by men. Women, who chose engineering career, should be encouraged to get involved in the design of technological innovations that are primarily meant for women including in the field of health sciences and medical innovations. (Nakafeero, Okello, Kazanka, Mandlate, Bantebva, 2013)

In the northern part of Nigeria, though they have a large number of females schooling; there is little participation of the females in the field of engineering, which gives a huge gap from the males participating in the engineering field. A research shows that there is more gender disparity in northern Nigeria, the global ratio of women studying and pursuing carriers in Engineering to men to be around 1:4 and due to a lot of issues concerning delivery mechanism, home condition, community and environmental influences which combine to create a lot of barriers for girls to study and pursue carriers in Engineering. (Nakafeero et al., 2013)

In Nigeria, according to the National Bureau of Statistics, women make up on average just 22% of the total number of Engineering and Technology university graduates each year. Research has shown that better and more useful tools are created when the developers fully represent the diversity of the societies we live in. Also, if care is not taken 90% of the jobs in the next 10 years will require technology skills and knowledge. If women are not well represented as technology users and developers, we will be left behind in tomorrow’s world. National Bureau of Statistics has it that women make-up roughly a fifth of the total number of people working in information and communication technology sector. (Women’s Technology Empowerment Center, 2016)

In some Nigerian culture men control the fertility of their women; which means that childbirth may limit their ability to engage in productive activities. Even after the provision of reproductive health services, this is not enough to ensure women’s ability to access them. Men in some cultures may see the decision over when and when not to have children to be their decision and large numbers of children may be read as a sign of male fertility and power, which becomes more important when masculinity is threatened. (Bradshaw, Castellino, Diop, 2013)

In the majority of cultures there is unequal gender and generational relations exist within most of the households where the ‘head’ of the family is said to be males. In some, women going to work may be interpreted as the man’s inability to make provision for the family and cater for their needs. This makes some men reluctant in allowing their wives to be working class personality and thus reducing women’s working class population. Often when women get involved in jobs or are working class personalities, it can improve their ability to take decisions in the households. Though it may lead to dispute between couples especially when the wife earns more than the husband, or if the woman is employed and the man is unemployed. (Bradshaw et al., 2013)

(Soto, 2017). Women choosing these educational paths and careers face many obstacles, starting with the stereotypes affecting girls and including the prejudice women face when they choose a field of study and the difficulty of combining their career with family responsibilities. Being a mother, may limit women from participating in science, and the circumstance is inevitable. Some women find it difficult to combine taking care of children and pursuing their career, raise funds, and so on. However, none of this is taken into consideration by some employers; where mothers might not be fully chanced unlike single persons who have much greater availability and flexibility. But motherhood should not be an obstacle to a woman’s career development. There should be a positive change in the participation of mothers and women in general, to increase the percentage of women scientists at higher levels, and make sure that women can manage both their motherhood and career wisely. (Soto, 2017)

2.2 The Effective Role of Women in Societal Development

Most societies that have gender disparity tend to have less rapid economic growth and poverty reduction than societies that have gender equality, and that social gender disparities produce outcomes that are not economically efficient. (World Bank 2001a) as cited in (Bradshaw et al., 2013)

Historically, the central role of women in society has ensured the continual stability, achievements and lasting innovative advancements of several nations. Women especially mothers, play a larger role in decision-making
about family meal planning and diet. Also, women have good initiatives in child care and nutrition of the children. (Gran, 2019)

2.2.1 Role of Women in Technology

(Ash, Gann, Dodgson, 2017) Women may hold up half the sky, according to a Chinese proverb, and make up half of the total users of technology, but they are not well involved in the present day technology and entrepreneurship. This is not convincing and should be of major concern in our society. It is dangerous to technological development, making the society to be lagging behind in economic progress. When airbags began to be introduced into vehicles, the past experience revealed that women and children were injured due to the fact that they were designed by and tested on men.

Technology companies managed by women, gets greater return on investment than technology companies managed by men. According to Forbes, it is found that technology entrepreneurs that are women, despite having a low venture capital funding, produce more revenues than their male technology entrepreneurs. (Ash et al., 2017)

(Afolayan, 2017) The role of women can never be overemphasize in the present day growth, because the world becoming a much better place with advance in technology and the role of women, women have a vital role to play in Information technology sector, but the women are less involved in the sector than men. Therefore, women need to set their priorities right craving to achieve more in this sector. Women are needed to get involved in this sector. There is a great desire for women who can improve our present day technology. Women should emulate the likes of Mark Zukerberg, Bill Gates and make their marks even more than these men. Women need to show that there is no sector they can't work with. Women generally should be encouraged to get involved in Information Technology sector.

2.2.2 Role of Women in Research

Huyer (2015) as cited in Kenny and O’Donnell (2017). There are fewer Women researchers in the present day compared to the researchers which are men. In the United Kingdom, women have few women researcher positions, who have low number of publications and patents. Also, Germany has a very low figure of publications and patents from women researchers (Schiebinger, 2010) as cited in Kenny and O’Donnell (2017). Women are less involved at each level of the research hierarchy in the United State; there are a larger number of women that assistant professors to full professors (Schiebinger, 2010) as cited in Kenny and O’Donnell (2017). The situation is worse in the private sector: in engineering, women have lesser number of paper authorship in universities and governmental institutes, also a very low figure in industry (Ghiasi et al., 2015) as cited in Kenny and O’Donnell (2017).

Kenny and O’Donnell (2017) A significant increase in positive change and effects can be gotten from the increase in women’s involvement in research. The current imbalance in research and innovation is driven by both implicit and explicit bias that leaves the field with a lower quality human capital stock than would exist absent such discrimination (Moss-Racusin et al., 2012) as cited in Kenny and O’Donnell (2017). In addition, male and female engineers that collaborate with both genders are about twice as productive (producing more articles that are more cited) than those who only collaborate with one gender (Ghiasi et al., 2015) as cited in Kenny and O’Donnell (2017).

2.2.3 Role of Women in Development

For any society to be developed there has to be contribution of every citizen of that society. Women are part of this numbers and research has it that women are the larger part of the world’s population. A society where, most citizens do not participate or get involved in its development, they would yield a low outcome. Here are some of the women who contributed to the development of their nation;

(SudyMoose, 2016) talks about Olufunmilayo Ransome Kuti, the wife of the renowned reverend Israel Ransome Kuti, who organized a lot of campaigns against colonial rule. Ellen Johnson-Sirleaf of Liberia who became Africa’s first female head of state, helped Liberia nation in advancement over the last decade. These women were able to rise above the limiting factor of their gender to contribute greatly to nation building in their time.

1st National Conference of WITED, Ilaro Chapter
Women involvement in societal market, develops the nations’ economy rapidly, Women’s economic participation decreases the dependency ratio and increases the proportion of wage earners to dependents. Women are also more likely than men to reinvest their earnings to benefit the family. (Cheryl et al., 2008)

Research showed that campaigns led by women across the globe are more successful than the campaigns led by men across a wide range of sectors, geography and cultures. Gender disparity should not be encouraged at any level. (Ash et al., 2017)

3. SOLUTIONS OR SUGGESTIONS ON HOW WOMEN CAN BE FULLY INVOLVED IN THE ONGOING TECHNOLOGICAL CHANGE AND SOCIETAL DEVELOPMENT

Having considered all these, the following solutions can help bring up the high involvement of women in technology, research and development. In summary, it is high time our society feel the effectiveness of the role women play in nation building though their involvement in technological change, research and development. Also, women should not allow the act of motherhood to affect our impact to our society. Young girls must be encouraged to develop interest in STEM subjects from an early stage because these girls are the women of tomorrow. To achieve this, women should be actively engaged in every field and organization. Teachers taking STEM subjects at the primary and secondary level should make the subjects interesting to the young ones so as that they can key in into the goal and not scare them. Government and private employers in the field of tech should give more room for female folks to be employed and also be allowed to occupy leadership positions.

There is a need to have a well structured and long lasting plan for the women and productive efforts, from schools, to universities and workplaces, to encourage women into technology careers. Research by PwC into over 2,000 school and university students shows the gender gap in technology starts early in their education and carries on through every stage of women’s lives. Girls are less likely to study STEM subjects at school, and this gap continues through to tertiary institutions. Over a quarter of women students say that they lack interest in pursuing a career in technology because they view it as too male dominated. We urgently need talented women role models in tech to challenge this perception. (Ash et al., 2017)

4. CONCLUSION AND RECOMMENDATION

4.1 Conclusion
Nigeria has the potential to be a global power, if we embrace and invest heavily in technology and innovation. Women’s voices are essential to the problem solving and innovation that is at the heart of Engineering. Enhancing girls’ interest in engineering could improve innovation and problem solving skills.

4.2 Recommendation
We need to do more, as both a society and an industry, to encourage girls to engage in STEM subjects in Schools. Support should be given to women pursuing engineering degrees in tertiary institutions and provide them with opportunities to thrive in their workplaces. Organizing several initiatives and going to Secondary Schools to organize career talks and encouraging girls to study Science, Technology, Engineering, and Mathematics subjects.

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MERGER AND ACQUISITION: A TOOL FOR GROWTH AND PROFITABILITY OF BANKS IN NIGERIA
(A CASE STUDY OF ACCESS BANK)

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ABSTRACT

Mergers and acquisitions is a form of corporate restructuring that are reform strategies which was adopted to reposition the banking sector. This research seeks to examine the impacts of mergers and acquisition on growth and profitability of deposit money bank’s performance in Nigeria as the main objective. The research used shareholders fund, profit after tax, and total assets of Access bank, PLC as proxies to measure the financial efficiency of the bank its post consolidation eras. This bank was selected for the study using judgmental sampling methods, data were collected from academic journals, Nigerian stock exchange archive, textbooks, magazines, newspapers, the company annual reports, and internet sources and data were subsequently analyzed using descriptive statistics. This research found out that “mergers and acquisition” is an effective means of ensuring the stability and profitability of the banks in Nigeria banking sector, the study also found out that shareholders fund and profit after tax has contributed significantly to the growth of the bank and that corporate restructuring has affected the capital adequacy of commercial banks positively. It was also discovered that synergy gains are the key motive for bank mergers. The study therefore recommended that for the survival of banks in Nigeria, the Central Bank of Nigeria (CBN) should encourage merger and acquisition among banks to bring about strong banking base. Business entities should merge so as to improve on their economics of scale, women in business are encourage to learn from the Access Bank experience.

Key words: Total Asset, Consolidation, Profitability, Shareholders’Fund, Synergy

1. INTRODUCTION

The Central Bank of Nigeria (CBN) choose to begin the Nigeria banking sector reforms process with the consolidation and recapitalization policy through mergers and acquisition. This was done in order to arrest systemic decay, restore public confidence, build a strong, competent with competitive players in the global arena, so as to ensure long life for the banks and bring higher returns to the investors. Chukuma Soludo who was the CBN governor then introduces merger and acquisition as a major policy reform to help banks boost their capital base during the period. In 2004, the main thrust of the 13-point reform agenda was the mandatory minimum shareholders' funds of 25 billion for Nigerian Deposit money banks not later than December 31, 2005. In view of the low capital base of all the banks in Nigeria as at that time, they were encouraged to merge. Out of the 89 banks that were in operation before the reform, more than 80 percent (75) of them merged into 25 banks while 14 that could not finalize their consolidation before the expiration of the deadline their practicing license were withdrawn by the Central Bank of Nigeria. Though these banks whose license were withdrawn seek redressed in the law court but their application never scaled through.

Due to the current economic climate in the country which is characterized by shortage of foreign exchange for the importation of goods, low exchange rate of the naira to the US dollar, credit policy and globalization, all of these have increased business risks and this poses serious threats to long term survival. As a result, previously autonomous business organization has recently been taking advantage of mergers and acquisitions, particularly in the banking and conglomerate sector of the economy to form larger concerns needed to reduce their risks and guarantee better chances of survival. A merger is defined by the Companies and Allied Matters ACT LFN (2004) as “any amalgamation of the undertaking of any part of the undertakings or interest of two or more companies or the undertakings or part of the undertaking of one or more company’s bodies corporate”.

Nwude (2013) define merger as an aspect of corporate strategy, corporate finance and management dealing with the combining of different companies that can aid, finance or help a growing company in a given industry to grow rapidly without having to create another business entity. One or more companies may merge with an existing company through consolidation. The new single company will inherit the assets and liabilities of the separately existing companies which are then wound up. Merger is consummated by exchange of shares among the merging company’s shareholders.

Acquisition or takeover is the purchase of controlling interest in one company by another company such that the acquired company becomes a subsidiary or division of the acquirer (Nwude, 2013). A company is said to acquire a controlling interest in another company if the acquiring company (the acquirer) purchased and holds not less than 51% of the target company’s issued and fully paid up ordinary share capital. At this level of acquisition the acquirer company becomes the holding company while the acquired company becomes the subsidiary of the acquirer. Hubbard (2001) as cited in Ikpefan and Kazeem (2013) argued that there are psychological differences between acquisitions and merger as the latter involve two partners of relatively equal size and power and a genuine attempt is made to combine the two entities into a culturally new one.

The adoption of merger and acquisition offers many benefits to the companies that are involved in it, such advantages includes management expertise, risk diversification, stock exchange quotation, increase market share, desire for growth, technological drive, profits, etc. Another reason for merger and acquisition is the belief that synergies exist, allowing the companies to work more efficiently rather than working separately. Such synergies may result from the firms combined ability to exploit economies of scale, share managerial expertise and raise larger capital.

The importance of merger and acquisition cannot be overemphasized, this prompted the researcher’s interest to examine the effect of merger and acquisitions on the value and profitability of Nigerian Banks with special reference to Access Bank PLC which after the survival of the Banks consolidation in 2005 it later acquired Intercontinental Bank in 2011 and currently is in a merger with Diamond bank. In december 2018 Access Bank PLC signed a memorandum (MOU) with Diamond bank PLC, to merge, the merger is expected to bring together Access Bank wholesale banking capability and Diamond Bank unparalleled retail experience and expertise (Wigwe, 2018). It is also certain that with the mergence the two banks now have 27million customers, 33,000 POS and 3,100 ATM points. The motivation for this study is to examined the effects of merger and acquisition as tool for profitability and growth of the banking business in Nigeria with a particular reference to Access Bank, PLC.

2. LITERATURE REVIEW

Merger and acquisition is use for resource maximization, it is use to pull resources together to achieve business growth. Merger means coming together of two or more organizations or business entities to become one big firm, such as the merger of AG Leventies and company Limited with Leventies Stores in 1983 (Nwude, 2004). Though (Adegbite, 1989) explained that merger and acquisitions were relatively new in Nigeria as at the 1980s, but was popularized by the Central Bank of Nigeria (CBN). Acquisition was defined by ( Amedu, 2004; Bello, 2004; & Katty, 2005) as the purchase or direct takeover of a small business by a big organization that share similar structure and motives or business objectives.

Banking reforms had always being an on-going activities around the globe from the 1980s up to the present day Nigeria as evidence from the research’s case study. Due to the impact of globalization more firms are coming together to create synergies to meet up with the continuous integration of world market and economies. Nigeria banking sector had witness reforms and the deregulation of the sector to meet up with globaliation, technological innovations and implementation of supervasory and prudential requirements that conform to international regulations and standards.

Soludo (2004) encouraged banks to merged and that bigger firms should acquired smaller one to achieve cost efficiencies through diversification to achieve economic of scale as well as expand on range of business activities for improved performance. Anthony (2008) was of the opinion that merger and acquisition help in addressing the problem of insolvency of banks, use in achieving business growth and survival in the short run and efficiency of banks in the long run in terms of performance. Jhawar and Muhajan (2019) were of the opinion that merger and Acquisition is useful for growth and expansion in any industry, in India it has assit in the survival of many banks due to their mergence with or acquisition by larger banks.
Alex (2019) examined factors that might affect the success of merger and acquisition of firms of similar structure, through the study carried out on the Kraft foods’ attempt in acquiring Cadbury a chocolate maker that is based in the United Kingdom. The complexity of the takeover were considered and identified as follows; the interest of government, politicians, the unions, customers and other interest group who are stakeholders in the eventual success of acquisition of Cadbury by Kraft Foods. Apart from complexities identified in (Alex, 2019) most studies did not focus on a positive relationship between merger activity and gains in either performance or stockholder wealth.

Weber (2010) looked into the importance of learning prospects on cultural integration of firms that are involved in merger and acquisition, the research examines managerial bias tendencies that might occur. The hypotheses that were tested examined whether perceptions of success increase the tendency to management’s actions and the resultant failure is due to cultural differences of the firms. Managers that were suddenly deprived of authority and promotion opportunities can be particularly bitter. Sometimes there may be specific personality clashes between executives in the two companies, which can lead to managerial bias (Stiroh, 2002).

Bommaraju, Aheane, Hall, Tirunillai & Lam, (2018) did a research drawn from the psychodynamic perspective of social identity theory to examine the causal effect of M&A involving a mismatch of external images on the sales force. The research was divided into two studies, study 1 and study 2. Study 1 is a natural longitudinal experiment that shows a merger with a poorer-image firm immediately dilutes salespeople’s Organisational Identification (OI) which in turn impairs their performance. Salespeople are seen as sense makers who are most of the experience stronger OI-dilution. As sense giver manager that emphasize firm’s strategies intent in their interactions boast the OI-diffusion effect, while those that are emphasize firm’s organisational culture aggravate the effect. Study 2 is a scenario- based experiment where further demonstrations that OI-dilution effect is stronger than the OI-enhancement effect from merging with a better-image firm. The two experiments confirm that the unfavourable effect of M&As that involve the mismatch of external images stems from image uncertainty rather than job uncertainty.

Using two banks as sample size (Odetayo and Olowe, 2013) conducted an empirical analysis on the impact of post -merger on Nigerian Banks profitability. Multiple regression analysis and the estimation is OLS with the aid of STATA software was used to interpret data covering 2005 to 2012 for Net Assets and shareholders fund. The findings reveal that post-merger has no significant impact on bank's profitability. Joshua (2010) discovered that the post- merger and acquisitions period was more financially efficient than the pre-merger and acquisitions period. Olagunju and Obademi (2012) also found that there is significant relationship between pre and post mergers and acquisitions on one hand and capital base of commercial banks and level of profitability on the other hand. Based on the work carried out by De-Nicolo, Philip, Jahanara and Zephirin (2003) on mergers and acquisitions in the financial sector, he concluded that merger and acquisition impacted positively on the efficiency of many banks.

Akpan (2007) using chi square to test his stated hypothesis found that the policy of consolidation and capitalization has ensured customers’ confidence in the Nigerian banking industry in term of high profit. Owolabi and Ogunlalu (2013), discovered that it is not all the time that consolidation transforms into good financial performance of bank and it is not only capital that makes for good performance of banks. Chen (2013), examines the impact of Merger and Acquisition (M&A) announcements on firms’ stock performance made by companies listed on the Hong Kong stock exchange. An event study methodology was used using forty-four events as the sample size. The study found that M & A announcement effect is significant over the event period and investors can earn abnormal return by trading an acquiring company two days before the announcement date.

Ikpefan and kazeem (2013) carried out an empirical study on post-consolidation effect of mergers and acquisitions on Nigeria deposit money bank. This study was carried out to find out the challenges faced by the banks during and after the exercise, the performance of these banks post consolidation and to check whether mergers and acquisitions has in anyway affected the banks and if so, in what ways. The panel data regression technique was used in the analysis and was found that M&A affect banks performance but does not affect banks’ cost of equity capital. Taiwo & Musa (2014) as cited in (Olokodana, 2018) who examined the impact of consolidation on the performance of listed deposit money banks in Nigeria covering a period of 12 years from 2000 to 2011 (6years pre & 6 years post); using a sample of four banks. Paired sample T-test was used to test the hypothesis formulated with reference to the following variables; Return on Asset, Return on Equity and Net profit margin. The study concluded that the consolidation reform in the Nigerian banking sector has impacted positively on Return on Assets, Net profit margin, but does not impact on Banks Return on equity. However,
Onikoyi and Awolusi (2014) differs from the earlier position on equity in their research on the effects of mergers and acquisitions on shareholders’ wealth in Nigerian banking industry, in a bid to establish relationship between; increase in capital base and shareholders wealth, the findings of the study showed that there was a significant relationship between shareholders wealth and the study concluded that mergers and acquisitions have positive effect on the shareholders wealth.

Based on the literature studied and the work carried out by other reseachers on Merger and Acquisition in Nigeria banking Industry, this work looked at the post consolidation era, and other mergers and acquisitions that banks has undertaken in other to grow their shareholders’ Fund and the their profits. Upon this the study identify the following objectives:

1. To examine whether merger and acquisition has positive effect on the profitability of Access Bank PLC
2. To examine whether Merger and Acquisition undertaken by Access Bank PLC has positive effect on the shareholders’fund
3. To assessed the effect of merger and acquisition on total assets of Access Bank PLC

Theoretical Framework

According to the research carried out by Tripe (2000) as cited in (Beneke,Schurink, and Roodt, 2007) on a small sample of seven to fourteen New Zealand banks it was found that five or six merged banks had efficiency gains based on the financial ratios while another only achieved a slight improvement in operating expenses to average total income. When a merger deal is examined efficiency theory leads to value creation with positive returns to the acquirer and the target firm. Merger often create economic sense for the acquiring firm if its shareholders beneficiaries from the economic advantages that the result of combined present value of the merged firms is greater than the sum of their individual present values as separate entities.

Synergy theory which is also called financial synergy form the main purpose why conglomerate merged. Chang (1990) as cited in (Beneke et. al., 2007) described financial synergy as the main intensity for Mergence, usually refers to financial synergy that is gained through the merging of conglomerates; economics literature explained the characteristics of synergy in the context of economies of scale that lead to reduction in cost and increase in revenue. Synergy was derived from a Greek word called “synergos” which means working together. Synergy is the ability of two or more business units or companies to generate greater value by working together than when they work separately. It is expressed in this mathematical equation as \[2+2=5\] and it can be expressed as \[1+1=3\]. Synergy motives are widely seen as the most frequently mentioned motives when managers want to embark on M&A project which was exert reason provided for MOU signed by Access Bank to merge with Diamond (Wigwe, 2018). Synergies is believed to be achieved by merging, that is, they are merger specific. Synergy takes the form of revenue growth mechanism tool and cost reduction technic used by management, operating efficiency is a form of synergy. Gaughan (2007) opined that operational synergy appears in the form of revenue enhancements and cost reductions. Financial synergy is achieved when the cost of capital is reduced by the activities where two companies decided to come together to form a single entity.

3. METHODOLOGY

The study evaluates the effects of merger and acquisition on shareholders’ value and profitability of deposit money banks in Nigeria over the period of nine years (2010-2018). Data were gathered through secondary source from the Annual Reports and Accounts of Access Bank PLC. These data include profit after tax, shareholders fund, and total assets. This study employs the technique of descriptive data analysis. The main reason for embarking on this study is that it allows for the measuring of the pattern of change and obtaining of factual information requiring collection on a regular basis. A descriptive statistics utilized in this study via graph and bar charts to examine the effects of merger and acquisition on the profitability, shareholders’ fund and the total asset of access bank. Access Bank PLC was selected as the sample size for the study in representation of all the banks listed on the Nigeria Stockexchange Market because it was involved in merger and acquisition activity recently. This bank was considered as a sample for easy access and availability of data. The sample size that was used to represent the whole population was determined using the judgmental sampling technique because of the easy availability of data to enhance the study. In 2011, Access Bank was in talks with the Central Bank of Nigeria to acquire Intercontinental Bank PLC, Intercontinental Bank became a subsidiary of Access Bank PLC, which recapitalized the former and acquired a 75% majority interest in its stock. In January 2012, the bank announced the conclusion of its acquisition of the former Intercontinental Bank creating an expanded Access Bank, one of the largest four commercial banks in Nigeria with over 5.7 million customers, 309 branches and over 1,600 Automated Teller Machines (ATMs).
The data was collected from the Published Annual Financial Reports and Accounts of the Access Bank PLC from 2010–2018 which covered over a period of nine years. Meanwhile, the secondary data instruments are sourced from the bank’s Annual Reports. The Annual Reports are reliable statutory reports, it is firmly asserted that the Annual Reports are documents of the bank which are produced regularly which comply with statutory standards. They also serve as the most important documents for the organization’s construction of its own social image.

Model Specification
Multiple Regression model was also used to test the significance of the influence of the dependent variable. The multiple regression Model was presented as below:

\[ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \]

Where:
- \( Y \) = the value of the dependent variable
- \( \alpha \) = the value of the intercept.
- \( \beta_1, \beta_2, \beta_3 \) = the coefficient representing the various independent variables.
- \( X_1, X_2, X_3 \) = Values of the various independent (covariates) variables.
- \( e \) = the error term which is assumed to be normally distributed with mean zero and constant variance.

\( Y = \) Merger and Acquisition (MAA)
\( X_1 = \) Profit after Tax
\( X_2 = \) Shareholders’ Fund (SHF)
\( X_3 = \) Total Asset (TOA)

4. FINDINGS AND DISCUSSION

Table 1

<table>
<thead>
<tr>
<th>YEAR</th>
<th>PAT (N'billions)</th>
<th>SHF (N'billions)</th>
<th>TOA (N'billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>12.9</td>
<td>182.8</td>
<td>726.9</td>
</tr>
<tr>
<td>2011</td>
<td>13.6</td>
<td>185.8</td>
<td>945.9</td>
</tr>
<tr>
<td>2012</td>
<td>31.6</td>
<td>187</td>
<td>949.4</td>
</tr>
<tr>
<td>2013</td>
<td>31.1</td>
<td>237.6</td>
<td>1,516.80</td>
</tr>
<tr>
<td>2014</td>
<td>39.9</td>
<td>274.2</td>
<td>1,981.00</td>
</tr>
<tr>
<td>2015</td>
<td>58.9</td>
<td>360.4</td>
<td>2,411.00</td>
</tr>
<tr>
<td>2016</td>
<td>76.6</td>
<td>421.7</td>
<td>3,094.90</td>
</tr>
<tr>
<td>2017</td>
<td>65.5</td>
<td>469.2</td>
<td>3,499.70</td>
</tr>
<tr>
<td>2018</td>
<td>68.1</td>
<td>440.8</td>
<td>3,968.10</td>
</tr>
</tbody>
</table>

Table 1 above show the amount of Profit after Tax (PAT), Shareholders’ Fund (SHF) and TOTAL ASSETS (TOA) of Access Bank PLC, from 2010 to 2018 financial years in billions of naira. The impact of merger and acquisition is shown by the increase in shareholders’ fund, which gave a direct increase in the profit after tax and the company’s total assets. This is further explained in the charts below.

Figure 1
Figure 1 shows the movement in Profit After Tax (PAT) of Access Bank PLC between 2010 and 2018. The PAT of the bank had the highest increase in 2016 and after the acquisition of Intercontinental Bank in 2011, there was a significant increase in the PAT in 2012 and continue on a steady increase to 2015.

Figure 2

![Graph showing SHF, PAT, and TOA](image)

Figure 2 displays the relationship of three variables under discussion, which merger and acquisition of a business entity had a direct impact and effect on. They are Shareholders' Fund (SHF), Profit After Tax (PAT), and Total Assets (TOA).

Figure 3

![Bar chart showing SHF and TOA in N'billions](image)

The bar chart in Figure 3 shows that the total assets of Access Bank PLC continue to increase from 2010 to 2018, even though there was a slight decrease in the bank’s shareholders’ Fund in 2018.
Figure 3 and 4 show the positive increase in SHF and PAT during the period of acquisition and after, giving a positive growth in both SHF and PAT. The shareholders’ fund slightly decreased in 2018 compare to what was earn in 2017 due to merger agreement that is on going between the Bank and Diamond Bank, PLC. But the TOA continue to grow as shown in figure 3.

Figure 5 display the graph showing the movement in Shareholders’fund (SHF) and Profit After Tax (PAT) the activities on the shares of the company at the Nigeria Stockchange Market had effect on the Profit After Tax of the Bank in 2018. But the merger and Acquisition which the company made in 2011 had a steady in increase on his SHF and PAT.
5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion
This study investigated the impact of merger and acquisition on the profitability of Access bank, PLC. Nigeria, the periods for study was between 2010 and 2018. Different theories were reviewed but the most relevant to this study is the theory of synergy which identified the reason and benefits for merging of two or more organizations, the main aim of merging or acquiring in the banking sector had a wide acceptance during the 2004 and 2005 consolidation of commercial banks, it was established that most banks merged to raise their profitability through enlargement of their market share which include shareholders fund. The banks that merged or acquired for the purpose of enlarging their market share and raise their profitability accounted for about 76% of all the mergers and acquisitions in the banking industry in Nigeria the consolidation era. There is positive relationship between shareholders fund and profit after tax while the total assets continue to increase steady not responding to the slight decrease in shareholders’ fund in 2017. Therefore the study make the following recommendation;

5.2 Recommendations
The Central Bank of Nigeria (CBN) is should carry out frequent appraisals and reappraisals of the performance of banks in Nigeria to avoid the systemic distress that preceded the banking sector before the 2004/2005 consolidation exercise which also reoccurred in 2010. The Central Bank of Nigeria (CBN) should encourage strongers to acquire weaker banks so that shareholders' fund will be protected as well as the depositors’ money while banks should be motivated to merge so as to enjoy the synergy that the merger will bring into the their banking business. Managers of merger and acquisition should mindful of firm’s culture and management bias so that it will not affect the successful results that is anticipated. Female business owners should not be scare of combining capital and business expertise because this will add more to the economic of scale of their business bringing more returns and economic powers.

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FNWC_Paper_007

GENDER MAINSTREAMING IN STEM AND ADMISSION POLICY OF NIGERIAN TERTIARY INSTITUTIONS

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ABSTRACT

Information, Communication and Technology (ICT) and Science-related jobs have been recognized globally as important parameters towards National Development. Due to this factor, majority of countries worldwide have considered STEM education a top priority for both males and females learners. However, gender differences in enrolment in STEM careers show a wide gap and disparity with females being underrepresented. This study, therefore, aims to empirically evaluate how gender mainstreaming in the admission policy and processes of higher educational institutions could be instituted as a policy measure towards bridging the gender gap in STEM disciplines in Nigerian Tertiary Institutions. In carrying out the study, two research hypotheses were formulated. The population of the study comprised educators in STEM disciplines of higher institutions in Ogun State, Nigeria. Multi-stage sampling and simple random sampling techniques were employed to select 144 STEM educators from three selected tertiary institutions (Olabisi Onabanjo University, Ago-Iwoye; The Federal Polytechnic, Ilaro and Federal College of Education Osiele, Abeokuta) in the study area. The study employed Probit Regression (and Average Marginal Effects) to analyze the data obtained through well-structured questionnaire administered among the participants (STEM educators). The findings reveal that an increase in efforts to adjust entry cut-off marks and quota requirements in favour of female students in tertiary institutions are more likely to reduce or bridge the gender gap in STEM disciplines by 1% and 4% respectively. The study affirms that adjusting entry cut-off mark and quota reservation system in favour of female students guarantees greater participation of female students in STEM disciplines in Nigerian Tertiary Institutions.

KEYWORDS: Gender, STEM, Gender Mainstreaming, Admission Policy, Tertiary Institution

1. INTRODUCTION

In developed and developing nations, attention for STEM education and career has been increasing as ICT-enabled jobs and STEM-related disciplines have been widely recognized as important in National Development. The global wave of market liberalization is generally seen as producing an interconnected world economy that has brought about unprecedented structural changes in the efforts of nations to master and exploit Science, Technology, Engineering and Mathematics (STEM) as a key determinant of economic growth, development and security. Hence, majority of countries consider STEM education a top priority and have or are developing strategies to improve not only teaching and learning but also the uptake of studies and careers in this area. Despite the policy provision that every Nigerian Child shall have a right to equal educational opportunities irrespective of circumstances, gender differences in enrolment in STEM careers show a wide gap and disparity, with females being underrepresented (Salman, Olawoye, & Yahaya 2011; Abe 2012). According to National Bureau of Statistics (2014) as observed in Parson (2016) women make up on average just 22% of the total number of Engineering and Technology university graduates each year. Several studies also indicate that STEM is a male-dominated sector in all stages of the professional development with women having under-representation both in training and professional climes and that many factors contribute to the gender disparity (Mansfield, Welton & Grogan, 2010).

Meanwhile, educators, scientists, researchers and stakeholders in Nigerian educational system have acknowledged that courses in STEM are veritable ways of stimulating socio-economic development and transformation (Wu, & Anderson, 2015; Bybee, 2010). The provisions of the National Policy on Education and the Science, Technology and Innovation Policy provide platforms for education and in Science and Technology with a view to promoting sustainable economic transformations that will harness, develop and utilize science,
technology and innovations to build a large, strong, diversified, sustainable and competitive economy that ensure a high standard of living and quality of life for all citizens (Akanwa & Kalu-Uche, 2015).

STEM (Science, Technology, Engineering, and Mathematics) involves the study of, and coherent integration among, various academic disciplines, especially the four cardinal disciplines of STEM (Wu, & Anderson, 2015). Bybee (2010) posit that STEM disciplines and education have the potential to provide opportunities for students to develop increasingly important 21st Century skills for complex problem solving, communication, and collaboration. It comprises areas of education that are important in preparing students for work in the technologically advanced world and is vital for the nation’s competitiveness in the global economy. STEM, according to Akanwa & Kalu-Uche (2015), is an approach to teaching and learning that integrates the content of Science, Technology, Engineering and Mathematics with behaviours needed for success in the 21st century workforce. It refers to interdisciplinary approach to learning where serious academic concepts are coupled with real life lessons with a view to ensuring that students apply science, technology, engineering and mathematics in contexts that make connections among educational institutions, work organisations, societies and the global enterprise maximally harnessed to compete in the emerging science and technology economy.

According to Chikunda (2010), there has been steady growth in admissions in higher education over the last few decades, but despite this, gender equity challenges have been unprecedented (Mkude, 2011). Women who manage to make it into university tend to specialize in social science and humanities programmes with limited enrolment in STEM programmes (Acheampong, 2014). Strategies to address gender disparity in STEM include advocacy to raise awareness; gender affirmative action; gender mainstreaming; and capabilities based policies and practices (Norgbey, 2016; Sinnes & Loken, 2014; Panagiota, Yota & Vasiliki, 2019; Sterling, 2019).

In the education sector, gender mainstreaming would imply the efforts and commitment of regulatory agencies and management of schools, colleges and educational institutions (True & Mintrom, 2001) to integrate women’s concerns into policy decisions and implementation in all areas through organisation and re-organisation, improvement, development and evaluation of policy processes, so that a gender perspective is incorporated in all policies at all levels and at all stages, by the actors involved in the policy-making (European Trade Union Committee for Education, 2009). Gender mainstreaming may thus entail a fundamental transformation of the underlying paradigms and processes in the education sector (Leo-Rhynie, 1999). The main objective of the science and technical education sector is the promotion of technical and science education and training, technology transfer as well as skills development to enhance the socio-economic advancement of the country. Universally, such education components are meant to provide technical learning that could assist the society in meeting its industrial aspirations (Lawal & Atueyi, 2017).

Some of the important elements for consideration in the mainstreaming of gender in education by overall national educational goals, objectives and priorities are seeking to make explicit the importance of gender as a factor for consideration in the process of education; ensuring gender equity in access both generally, and in relation to studies which lead to better careers and job opportunities like STEM; overcoming structural barriers, legal, economic, political, or cultural which may influence the access and/or participation of either sex in educational offerings (Leo-Rhynie, 1999; Botella, Rueda, López-Iñesta & Marzal, 2019). The objective of any effort to bridge the gender gap should be to improve the participation, achievement and continuation of girls and women in STEM education and careers to reduce the gender gap in STEM disciplines and professions, strengthen the capacity and expanding opportunities for the female to deliver gender-responsive STEM training, and enhance awareness of the importance of STEM education for girls and women (UNESCO, 2018). Technological sector is the driver of most development initiatives and has been argued to be highly dynamic and shows tremendous potential for innovation and for introducing changes impacting deeply on the society. The technology sector therefore demands large numbers of graduates in science, technology, engineering, and mathematics (STEM).

In light of this, the study aimed at empirically evaluating how gender mainstreaming in the admission policy and processes of higher educational institutions could be instituted as a policy measure towards bridging the gender...
gap in STEM education in Nigerian tertiary institutions. Accordingly, the study posed to provide scientific response to a question bordering on how admission policy of Nigerian tertiary education system through entry cut-off mark requirement and quota reservation could contribute towards bridging the gender gap in STEM disciplines. Given the nature of the research, field survey was conducted among selected STEM educators in three tertiary institutions in Ogun State Nigeria to provide grounds for reliable outcomes that could help inform gender-sensitive developmental policies of governments.

Statement of the Problem

STEM is broadly perceived as a vital driver of sustainable development worldwide. However, women remain underrepresented with considerable gender inequalities in STEM fields despite decades of effort to bridge the gender gap. Several studies indicated that women are under-represented in STEM both in training and professional climes. These inequalities reflect in several aspects of education which are of concern in the pursuit of gender equality and equity (Leo-Rhynie, 1999; Mansfield, Welton, & Grogan, 2010).

Proponents of gender equality in higher education contend that inequalities in higher educational institutions are structural and require a closer look within institutions (Monroe & Chiu, 2010; LaCosse, Sekaquaptewa, & Bennett, 2016). Many scholars have used different approaches to explain the issue of gender disparity in STEM programmes but none has emphasized gender mainstreaming in the admission of students into STEM programmes in tertiary institutions. Admission of students into Nigerian higher educational institutions is done through Unified Tertiary Matriculation Examinations of the Joint Admission and Matriculation Board. The admission consideration and policies take cognizance of Catchment Area, Merit, Educational Less-Developed State (ELDS) and Discretion with no provision to really address the issue of gender gap in certain programmes such as STEM. Hence, it is important to examine how gender mainstreaming in admission process and criteria for higher education in Nigeria could serve as policy strategies or measures that will make higher educational institutions and policy agencies to create an environment to promote women enrolment in STEM courses through a review and revision of regulations and other admission requirements and conditions.

Hypotheses

In line with the objectives of this study, the following hypotheses were formulated:

H₀₁: Adjusting Entry Cut-off Marks into STEM discipline in favour of women will not yield significant impact in bridging STEM gender gap in Nigerian tertiary institutions.

H₀₂: Quota Reservation for female in admission into STEM courses will not contribute to the bridging of gender gap in STEM of the Nigerian tertiary institutions.

2. METHODOLOGY

The study employed field survey with the extensive use of primary data obtained via structured questionnaire. The population comprised educators in STEM disciplines of tertiary institutions in Ogun State, Nigeria. The choice for selection of Ogun State is informed by the fact that the State has highest number of tertiary institutions in Nigeria in terms of Colleges, Polytechnics and Universities settings (Wikipedia, 2019). Multi-stage sampling was used as sampling technique to select the final sample of the study. Firstly, the researcher used the total number of tertiary institutions in Ogun State as the initial population to ensure true representation of STEM educators in the state. The State has a total number of twenty-two tertiary institutions including both private and government owned schools (Wikipedia, 2019). However, given the fact that STEM disciplines are more popular in science and technology-oriented higher institutions the researcher selected three (3) institutions from the State. This includes Olabisi Onabanjo University, Ago-Iwoye; The Federal Polytechnic, Ilaro and Federal College of Education, Osiele, Abeokuta. The head counting of STEM educators at visitation by the researcher to the three selected institutions yielded 230 educators who are lecturers in STEM disciplines. This visitation took place during the pilot study conducted by the researcher.
Following the procedural process of scientific selection of sample size determination from a definite population as recommended by Krejcie and Morgan (1970) and closely observed in Nur (2017), a sample size of 144 potential respondents was obtained. Structured questionnaire as data collection instrument was employed to obtain the perception of STEM educators on how gender mainstreaming in the admission policy and processes of higher educational institutions could be instituted as a policy measure towards bridging the gender gap in STEM education in Nigerian higher education. The samples (respondents) were selected using simple random sampling approach. The data instrument contains close ended questions on a 5-point likert type scale with options Strongly Agreed, Agree, Undecided, Disagree and Strongly Disagree and nominal values of 5, 4, 3, 2, and 1 respectively for independent variables for the study. On the other side of the coin, categorical question on dependent variable with two options was asked from the respondents. The unit of analysis of the study is the STEM educator. Items on the questionnaire were adapted from Gender Mainstreaming scales of Leo-Rhynie (1999), Unicef (2007) and Gollifer & Gorman (2016).

The study utilizes probit regression to model dichotomous outcome, STEM gender gap variable with a combination of factors in admission policy. Probit regression is a special type of Generalized Linear Models (GLM) where the bivariate outcome such as the dependent variable of the study is qualitative and has a Bernoulli distribution (Karlin, 2019; Williams, 2018; Lemeshow, 2000; Long, 1997). In line with the estimation technique, the study adopted and adjusted probit models by Karlin (2019) with earlier probit model developed by Katchova (2013) to inform the model specification of the study as stated as below:

\[ P[Y_i = 1] = \phi(X' \beta) \quad \text{equation 1 (Karlin, 2019)} \]
\[ F(x' \beta) = \phi(x' \beta) = \int_{-\infty}^{x'} \phi(z)dz \quad \text{equation 2 (Katchova, 2013)} \]
\[ P[Y_i = 1] = \phi(x' \beta) = \int_{-\infty}^{x'} \phi(z)dz \quad \text{equation 3 (Adjusted Model)} \]
\[ P(SGAP_i = 1) = \phi(ADMP_i \beta) = \int_{-\infty}^{ADMP_i} \phi(z)dz \quad \text{equation 4} \]
\[ P(SGAP_i = 1) = \phi(\sum [ETCM_i \beta_1 + QOTA \beta_2]) = \int_{-\infty}^{\Sigma[ETCM_i \beta_1 + QOTA \beta_2]} \phi(z)dz \quad \text{eqtn 5} \]

Equation 5 is the final model of the study where SGAP (Y) = STEM Gender Gap; ADMP (X) = Admission Policy; ETCM = Entry Cut-off Mark; QOTA = Quota Reservation; \( \phi = \) link function; \( z = z\)-score (location estimate); \( P(SGAP_i = 1) = \) cumulative distribution function of the standard normal distribution; \( P = \) Probability; \( \beta = \) vector of coefficients (\( \beta_1 \) and \( \beta_2 \) in this study); \( \beta_1 = \) coefficient of ETCM; \( \beta_2 = \) Coefficient of QOTA; \( i = \) unit of observation (STEM educator)

The a priori expectation of the study implies that the vector of coefficient has negative relation with the outcome variable of the study. Mathematically, this is stated as: \( \beta_1 < 0 \) and \( \beta_2 < 0 \). It is important to mention that the estimation was carried out with the use of Maximum Likelihood Method (MLM). Moreover, the researcher also specified marginal effect model for the study following the adoption of such model from Spermann (2009) as highlighted in equation 6. The specification of marginal effect model (Equation 7) is informed by the rationale to provide ground for interpretation of magnitudes of probit model coefficients.

\[ \frac{\partial P(y_i = 1|x_i)}{\partial x_i} = \frac{\partial E(y_i|x_i)}{\partial x_i} = \phi(x_i \beta) \quad \text{equation 6} \]
\[ \frac{\partial P(SGAP_i = 1|ADMP_i)}{\partial ADMP_i} = \frac{\partial E(SGAP_i|ADMP_i)}{\partial ADMP_i} = \phi(ADMP_i \beta) \quad \text{equation 7} \]
3. RESULTS AND DISCUSSION

From the total 144 questionnaires administered among the STEM educators in three selected higher institutions in the study area, nine (9) of it were not returned by the respondents while six (6) out of the returned contained missing responses on key variables of the study. This implies that 129 questionnaires were found effective for analyses, thus yielded retrieval rate of 90%, that is approximately 90% by indication. Scale reliability of battery of items in the returned questionnaire was obtained through Cronbach alpha coefficient via STATA 12 Software. The result indicates a scale reliability coefficient of 0.74, a value higher than the acceptable minimum value of 0.70 (Pallant, 2011), hence, good consistency of the research instrument. The information in Table 1 reveals that the model of the study is overall significant (Prob > chi2 = 0.0000) which implies that probit model employed by the study is a significant model to explain gender gap in STEM disciplines across tertiary institutions in the study area.

Further, the result in Table 1 shows that adjusting entry cut-off mark and quota requirement in favour of female students are significant parameters in admission policy that can be employed by tertiary institutions in Nigeria to bridge the gender gap in STEM disciplines. From Table 1, an increase in efforts to adjust entry cut-off marks and quota requirements in favour of female students in tertiary institutions are more likely to reduce or bridge the gender gap in STEM disciplines. This interpretation, however, is about the signs of the predictors’ coefficients and not their magnitudes. For interpretations of the magnitudes of the regressors, the researcher employed the analysis output from Average Marginal Effects analysis as contained in Table 2. From the Table, an increase in efforts to adjust entry cut-off marks in favour of female students in tertiary institutions is more likely to reduce or bridge the gender gap in STEM disciplines by 1% and an increase in efforts to make quota requirements in favour of female students in tertiary institutions is more likely to reduce or bridge the gender gap in STEM disciplines by 4%.

| SGAP | Coef. | Std. Err. | z     | P>|z| | [95% Conf. Interval] |
|------|-------|-----------|-------|------|------------------------|
| ECTM | -0.0103189 | 0.0849307 | 0.12  | 0.033 | -0.17678, 0.1561422 |
| QOTA | -0.0528301 | 0.0923967 | 0.57  | 0.000 | -0.2339244, 0.1282642 |
| _cons| 0.5589095 | 0.4486434 | 1.25  | 0.213 | -0.3204155, 1.438234  |

Source: STATA Outputs, 2019

The key findings of the current research suggest that adjusting admission policy of higher education institutions in favour of potential female students through entry cut-off mark and quota reservations is important to bridge gender gap in STEM disciplines. These findings conform to the a priori expectation of the study. From the study, it was discovered that an increase in efforts to adjust entry cut-off marks and quota requirements in favour of female students in tertiary institutions are more likely to reduce or bridge the gender gap in STEM disciplines. The findings of the current research are consistent with previous findings by Botella (2019) and Leo-Rhynie (1999). The implication of the findings by this research is that bridging gender gap in STEM disciplines can help create opportunities for ladies and women to improve their socio-economic condition.
particular, the findings of the current research suggest that application of the study empirical-proven approaches are creative ways to promote gender equity in education sector and societal development programmes at large.

4. CONCLUSION AND RECOMMENDATION

4.1 Conclusion

This study employed probit model to empirically evaluate the effectiveness of higher education institutions admission policy criteria such as entry cut-off mark and quota reservation in bridging gender gap in STEM disciplines. From the findings of the study, scientific analysis proves that these admission policy parameters are vital to bridge such gender gap. Therefore, the study affirms that adjusting entry cut-off mark and quota reservation system in favour of female students guarantees greater participation of female students in STEM disciplines in Nigerian tertiary institutions.

4.2 Recommendations

- Encouraging female gender participation in STEM should be a priority of tertiary institutions in Nigeria.
- Mainstreaming gender into the admission criteria of Universities, Polytechnics and Colleges of educations should be considered for integration into admission policies and conditions.
- Female should be encouraged and motivated into STEM courses and discipline through a purposeful adjustment of admission cut-off in favour of the female gender.
- Policy makers in the education sector, Joint Admission and Matriculation Board, Management of tertiary institutions, government agencies and stakeholders in education should give attention and commitment to gender issue in the enrolment criteria of tertiary institutions especially in STEM disciplines.

References


SENSORY ASSESSMENT AND ACCEPTABILITY OF TWO VARIETIES OF JOLLOF RICE FOR SALE TO INBOUND TOURISTS IN NIGERIA

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ABSTRACT
Inbound tourists’ preference of jollof rice prepared from two varieties of rice grains was determined in this study by assessing their sensory qualities. Extant literature was surveyed to review the nutritional qualities of the rice varieties. Respondents for the study included twenty-five panelist who were selected from among expatriate and local employees of Dangote Cement Plc Ibese, Ogun State, Nigeria, who took part in the sensory assessment of the two dishes. Sensory assessment score sheet prepared in a 9-point hedonic scale was administered to the respondents to delimit the organoleptic qualities of the rice varieties. One-way Analysis of variance (ANOVA) was used to determine the mean difference of responses between Agric Jollof Rice and Aroso Jollof Rice. The Result indicated superior overall acceptability for Agric Jollof Rice with a mean difference of 8.52 compared to Aroso Jollof Rice with mean of 7.56. Additionally, the p-value for overall acceptability (0.016 ≤ 0.05) shows a significant difference between the two rice varieties thus indicating preference between the products. The study recommends culinary entrepreneurs in local restaurants to diversify their vocation using the opportunity created by the acceptance of the local food by inbound tourists to reinvent other local food products and gastronomy tourism towards relevant niche tourism implications.

Keywords: Cooking, gastronomy tourism, jollof rice, niche tourism, Nigerian dishes.

1. INTRODUCTION
The continuous evolution of tourism is creating new and interesting opportunities for tourism practitioners in the experience economy. Over the years, tourism has advanced from the sightseeing division to other niche segments that deal with exploration of the culture and philosophies of destinations, including gastronomy tourism. While inbound tourists seek new experiences to make each travel a unique activity, food has been discovered as a major determinant of the overall travel experience that could develop to an impediment or catalyst to inbound tourism development for a destination (Andersson, Mossberg & Therkelsen, 2017; Ukabuilu, Nwokorie & Ezeibie, 2018). Since food has been observed as a major tourism product, it has led to the emergence of so many varieties of culinary vocations to meet tourism demand (Bessière & Tibere, 2013, Dimitrovski, & Crespi-Vallbona, 2017; Andersson, et al., 2017).

Domestically, entrepreneurship is gradually opening up new vistas in the food industry especially for young professionals in developing societies. Recent studies in the past 15 years have indicated how individuals are getting busy with all forms of vocations (in developing countries) that take them away from home for a reasonable period and does not allow form ample time to prepare their own meals at home (Ares & Gámbaro, 2007; Ariffin & Maghzi, 2012; Alam & Sayuti, 2011; Long, 2017; Obiora & Nwokorie, 2018). This gives rise to the consequent habit of eating out especially in local restaurants.

A large percentage of staple food commodities demanded in Nigerian restaurants are carbohydrate based which are required for prompt energy supply (Nwokorie, 2015). Chieﬂy among these staple foods demanded in local restaurants is rice (Oryza sativa L.) which belongs to the family of poaceae (Vikram, Kewat, Khan, Husain & Gyanendra, 2018). It is one of the three major leading food crops of the world and forms the staple diet of about half of the world’s population, as the global production has been estimated to be at the level of 650million hectares (Muthayya, Sugimoto, Montgomery & Maberly, 2014; Vikram, et al., 2018).

In addition to being valuable for use in medical and functional foods, rice is used mainly in human nutrition (Medleaf, 2009). Besides being the main source of calories and protein, rice is an important cereal because it has the highest digestibility biological value and protein efficiency ratio (PER) among all the cereal (Kaul, Jain, & Olakh, 2019). Rice contains two major subspecies; the sticky, short-grained variety and the non-sticky, long-grained variety (Shabbier, Arjurn, Zahoor & Nawaz, 2008; Srivastava & Jaiswal, 2013). Long grain rice is preferred when the grain is wanted to stay separate during cooking, while short grain is used to give a stickier,
more viscous appearance. Rice has varieties of dishes but the common dish of rice mostly eaten in Nigeria and other parts of West Africa is Jollof rice which is a very common African dish consisting of rice and spices along with beef, fish or poultry (Mbaiwa, 2005; Nana Ato & Mensah, 2006; Osseo-Assare, 2006; 2010; Nwokorie, 2015).

For profitable vocation in the food service sector, culinary experts are expected to regularly consider the preference of consumers in order to determine the best options in provision of services to enhance customer loyalty and improved dining experience. On the other hand, tourists and other travelers form a large percentage of restaurant customers whose travel satisfaction and overall holiday experience is influenced by the food they eat (Bjork & Kauppinen-Raisanen, 2017). This requires that restaurant entrepreneurs should deliver quality dining services by ensuring that the most acceptable food commodities are produced and served in such a way that customer loyalty is achieved to also foster business survival.

Consumption of jollof rice is very common in most West African restaurants. However, customer satisfaction in the overall dining experience have not been taken into consideration in most local restaurants, which has been a major reason why most food service businesses fail (Nwokorie & Ezeibe, 2017). Therefore, the quality of the particular type of rice (grain) used for the preparation of the dish will contribute to the outcome of overall dining experience. Consequently, it is necessary that restaurant entrepreneurs determine the best alternative between the long and short grain rice species in the preparation of jollof rice and to access the level of acceptability of the two varieties for sale in local restaurants especially for improving inbound tourist experience and enhancing their stay.

Gastronomy tourists demand new and sustainable travel experiences that could be enriched through existing and emerging culinary expertise with both local and continental dishes. Indeed, indigenous food products can be personalized or repackaged to portray the indigenous culture of a location, thus producing a unique and rewarding experience for a particular segment of a niche tourist destination (Parasecoli & Abreu eLima, 2012; Long, 2017). This serves as a catalyst for driving the economic environment due to the dynamic variables surrounding the experience economy that create significant exchange of goods and service (Akpan, Ikon, Okereke & Momoh, 2016) in the sectors having linkages with the hospitality and tourism industry including banking, agriculture, transport and manufacturing (Nwokorie & Obiora, 2018).

1.1 Objectives of Study
The major objective of this study is to assess the overall acceptability of jollof rice dishes prepared from two varieties of rice grain: agric and aroso rice grains. Specifically the study was meant to:

a. Examine the sensory qualities of jollof-rice prepared from agric and aroso varieties of rice grain.
b. Examine the level of acceptability of jollof-rice prepared from agric and aroso varieties of rice grain using their sensory qualities.
c. Examine the significant relationship between the jollof-rice prepared from agric and aroso varieties of rice grain.

1.2 Research Question
a. What are the sensory qualities of jollof-rice prepared from agric and aroso varieties of rice grain?
b. What is the level of acceptability of jollof-rice prepared from agric and aroso varieties of rice grain using their sensory qualities?
c. What is the relationship between the jollof-rice prepared from agric and aroso varieties of rice grain?

1.3 Significance of Study
The study will encourage local rice farmers to develop rice species which would reduce dependence on import to meet local demand thereby creating jobs and improving the local economy. Culinary vocation will equally benefit from the study as it would provide the avenue for restaurant owners to understand customer preference in their choice of rice dish thereby enhancing customer loyalty and profit maximization for the business. The study will also inspire research in agriculture and crop production on how to improve the yield of the preferred rice species which will, in turn, benefit the agricultural sector. New vistas will open for gastronomy tourism through complimentary dishes that would emerge as a result of new demands that would arise from the evolving experience economy.

2. LITERATURE REVIEW
Rice, a monocotyledon, is normally grown as an annual plant and can survive as a perennial crop for up to 30 years. Its cultivation is well suited in countries and regions with low labour costs and high rainfall, while its
The growth period of the rice plant is three to six months (90 to 180 days), depending on the variety and the environment in which it is grown. During this time, there are three distinct growth phases; vegetative, reproductive and ripening (IRRI, 2009). Visual characteristics of rice grains are important search attributes that affect consumers’ purchasing decisions (Medleaf, 2009). Grain size is mainly based on the length. On the other hand, grain shape is based on length-to-width ratio (Shabbier, et al., 2008). The classification of rice samples is not standardized across different countries and different markets (Ito, Nguyen, Takashi, & Chandaworn 2009). The routine classification system used by the International Rice Research Institute (IRRI) breeding program is as follows; short (< 5.50mm), medium or intermediate (5.51-6.60mm), long (6.1 – 7.50mm) and very long (>7.50mm). The grain shapes of rice likewise can be described based on the routine value ranges used in IRRI; bold (2.0), medium (2.1-3.0) and slender (3.0) (Ito, 2010). Chalky areas in rice grains; those opaque white parts of the grain are deemed, generally, to represent poor quality in many rice market segments. Thus these grains fetch lower market price (Ito, Takashi, & Tomohiro, 2007). Grains, according to Julianio (2009), are classified based on the proportion of the grain that is chalky; none (0%), small (<10%), medium (10-20%) and large (>20%).

2.1 Nutritional Value of Rice
Cooked, unenriched, white long-grained rice is composed of 68% water, 28% carbohydrates, 3% protein and negligible fat (Srivastava, & Jaiswal, 2013). In a 100 gram serving, it provides 130 calories and contains no micronutrients in significant amounts, with all less than 10% of the daily value – dv (Juliano, 2009; Srivastava, & Jaiswal, 2013). Cooked, white, short-grained rice also provides 130 calories and contain moderate amounts of B vitamins, Iron and manganese (10-17% dv) per 100 gram amount (Srivastava, & Jaiswal, 2013).

A detailed analysis of nutrient content of rice suggests that the nutrition value of rice varies based on a number of factors. It depends on the strain of rice, such as white, brown, red and black (or purple) varieties having different prevalence across world regions (Hammermeister, 2008). It also depends on nutrient quality of the soil rice is grown in, whether and how the rice is polished or processed, the manner it is enriched, and how it is prepared before consumption (Hammermeister, 2008; Srivastava, & Jaiswal, 2013).

2.2 Possible Food Dishes Derived from Rice
Rice is one Nigeria food almost 80% of homemakers cannot do without. It can be cooked directly or grounded to make flour. Rice can also be used for breakfast, lunch or dinner. The following meals can be obtained from rice: rice sweet pancake, jollof rice, savoury rice, plain board rice, natured rice, rice puff, rice “agidi” or “kafa”, rice mould, rice banku among others (Osseo-Assare, 2006; Nwokorie, 2015).

2.3 Jollof Rice
Jollof rice is an indigenous delicacy of the West African people of Ghana, Nigeria, Mali, Senegal, Cote D’Ivoire, Sierra Leone, Togo, Benin Republic, Liberia, Niger and Gambia. It is said to have derived its name from the Wolof people of Senegal. The “Wolof” is a one-pot rice dish also called Benachin, popular in many West African countries (Osseo-Assare, 2006; McCann, 2009). The dish consists of rice, tomatoes, tomato paste, saturated fat or cholesterol, onions pepper, salt and spices (such as nutmeg, ginger and curry), while optional ingredients can also be added such as vegetable, meat or fish. (Juliano, 2007).

The consumption of jollof rice became popularly embraced because it is an energy booster since it is made from rice which contains carbohydrates. It also contain a healthy mix of onions which helps reduce the risk of heart diseases and cancer; and pepper which contain vitamins to boost immunity and give healthy night vision (Srivastava & Jaiswal, 2013).

From the tourism perspective, the experience economy has given rise to an all new dimension of special interests leading to the emergence of other niche tourism aspects including gastronomy tourism. Implications of food tourism studies reveal emerging destinations which focus on food tourists, food destinations, and hygiene based issues with the use of qualitative and quantitative approach (Lee & Scott, 2015). Food equally serve as part of the many cultures of a people, and so can form part of the cultural tourism experience. This shows that food (and beverages) can form an integral part of cultural tourism (Ignatov & Smith, 2006; Perkins, 2014; Nwokorie, 2015) and can equally enhance the attraction of a tourist destination (Visser, 2007; Nwokorie, 2015). The recent surge in gastronomy tourism has led to the rise in new types of food resources which can be used as...
tools for urban renewal (Dimitrovski & Crespi-Vallbona, 2017). While Frisvoll, Forbord and Blekesaune (2016) observed that food has become an embodiment of cultural and regional identity, it can therefore be leveraged upon for innovative hospitality and tourism undertakings, thereby identifying emerging tourism destinations, creating jobs and alleviating poverty.

3. MATERIALS AND METHOD
Food commodities used (in food preparation) for the study were purchased from the local market in Ilaro from local traders. Production and sensory evaluation were carried out in the kitchen and restaurant of Yewa Frontier Hotel Ilaro, Ogun State, in May 2019.

3.1 Materials
Cooking equipment used in the study include: cooking pot, kitchen knife, mixing bowl, gas (for energy), cooking spoon, spatula, colander. The recipe for the preparation of each of the species is thus presented:

<table>
<thead>
<tr>
<th>Recipe</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>400 grams</td>
</tr>
<tr>
<td>Tomato puree</td>
<td>200 grams</td>
</tr>
<tr>
<td>Pepper</td>
<td>100 grams</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>150 grams</td>
</tr>
<tr>
<td>Salt</td>
<td>2 teaspoons</td>
</tr>
<tr>
<td>Maggi</td>
<td>2 cubes</td>
</tr>
<tr>
<td>Water</td>
<td>1 1/2 litres</td>
</tr>
<tr>
<td>Curry powder</td>
<td>1 teaspoon</td>
</tr>
<tr>
<td>Onions</td>
<td>250 grams</td>
</tr>
<tr>
<td>Nutmeg</td>
<td>20 grams</td>
</tr>
<tr>
<td>Thyme</td>
<td>10 grams</td>
</tr>
<tr>
<td>Jollof rice spice</td>
<td>20 grams</td>
</tr>
<tr>
<td>Margarine</td>
<td>20 grams</td>
</tr>
<tr>
<td>Crayfish</td>
<td>200 grams</td>
</tr>
<tr>
<td>Ginger</td>
<td>100 grams</td>
</tr>
<tr>
<td>Garlic</td>
<td>100 grams</td>
</tr>
<tr>
<td>Fish/meat stock</td>
<td>as may be required</td>
</tr>
</tbody>
</table>

3.2 Method
The method adopted for preparing the individual dish is as follows:

i. Place medium size pot on heat and allow it to dry, after which vegetable oil is added to simmer (2 minutes)

ii. Slice onions and pour in the oil. Allow to simmer (1 minute)

iii. Add tomato paste, with blended pepper and fry for (10 – 15 minutes)

iv. Add magi, curry, thyme, nutmeg, jollof rice spice and keep frying

v. Add water and salt (5 minutes)

vi. Rinse rice with warm water and pour into the boiling stew

vii. Turn with spatula and allow to cook (25 minutes)

viii. Add margarine when it is about to dry (and stir) to give it a good aroma and taste.

Note: the meal is served with protein – either of beef, fish or poultry (sizeable quantity)

3.3 Population Sampling
Convenience sampling was adopted in selecting 30 local and expatriate employees of Dangote Cement Plc Ibese, Ogun State. The reason for the choice of respondents is premised on ensuring a multicultural approach to the study which is expected to produce a more generalized result. Taro Yamane formula, given by Schawnms (1994) was adopted in determining the sample size for the study, hence sample size for the study is 27.

3.4 Data Collection and Analyses
Sensory evaluation score card was prepared in a nine-point hedonic scale to test for appearance, colour, texture, taste, aroma, flavour, spreadability and overall acceptability to elicit responses from the panelists. The 27 questionnaires distributed to the panelists were completed during sensory evaluation and returned, showing a 100% response rate. However, two score cards were improperly completed, hence unusable (7.40% of returned score cards). Consequently, the 25 usable instruments amount to 92.6% of the total number of returned score cards. One-way Analysis of Variance (ANOVA), with the aids of Statistical Package for Social Science version 20.0 (SPSS), was employed to determine the significant differences in treatment of means, and least significant differences (LSD) analysis to separate means and determine outcomes.
4. RESULTS AND DISCUSSION

Table 1: Demographic Details of Respondents

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item</th>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gender</td>
<td>Male</td>
<td>15</td>
<td>60.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>10</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>25</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>Age</td>
<td>18 - 25 years</td>
<td>2</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 - 30 years</td>
<td>7</td>
<td>28.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 and above</td>
<td>16</td>
<td>64.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>25</td>
<td>100.0</td>
</tr>
<tr>
<td>3</td>
<td>Education</td>
<td>Informal</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Formal</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Nationality</td>
<td>Africans</td>
<td>9</td>
<td>36.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Europeans</td>
<td>6</td>
<td>24.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asians</td>
<td>10</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>25</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Data output

Demographic details revealed that 60.0% of the respondents are males while 40.0% are females. All the respondents are adults above 18 years of age with formal education, which has a justifiable implication on the quality of their response. As much as 40.0% and 24.0% are Asian and European expatriate employees (64.0% foreign panelists), while 36.0% are of African origin (Table 1)

Table 2: Descriptive Statistics

<table>
<thead>
<tr>
<th>S</th>
<th>Mean (x)</th>
<th>Std. Dev. (±)</th>
<th>95% Confidence Interval for Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>Appearance</td>
<td>AGJR</td>
<td>25</td>
<td>8.56</td>
</tr>
<tr>
<td></td>
<td>ARJR</td>
<td>25</td>
<td>7.88</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>8.22</td>
</tr>
<tr>
<td>Colour</td>
<td>AGJR</td>
<td>25</td>
<td>8.40</td>
</tr>
<tr>
<td></td>
<td>ARJR</td>
<td>25</td>
<td>7.72</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>8.06</td>
</tr>
<tr>
<td>Texture</td>
<td>AGJR</td>
<td>25</td>
<td>8.28</td>
</tr>
<tr>
<td></td>
<td>ARJR</td>
<td>25</td>
<td>7.48</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>7.88</td>
</tr>
<tr>
<td>Taste</td>
<td>AGJR</td>
<td>25</td>
<td>8.44</td>
</tr>
<tr>
<td></td>
<td>ARJR</td>
<td>25</td>
<td>7.56</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>8.00</td>
</tr>
<tr>
<td>Aroma</td>
<td>AGJR</td>
<td>25</td>
<td>8.32</td>
</tr>
<tr>
<td></td>
<td>ARJR</td>
<td>25</td>
<td>7.76</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>8.04</td>
</tr>
<tr>
<td>Flavour</td>
<td>AGJR</td>
<td>25</td>
<td>8.40</td>
</tr>
<tr>
<td></td>
<td>ARJR</td>
<td>25</td>
<td>7.76</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>8.08</td>
</tr>
<tr>
<td>Spreadability</td>
<td>AGJR</td>
<td>25</td>
<td>7.96</td>
</tr>
<tr>
<td></td>
<td>ARJR</td>
<td>25</td>
<td>7.60</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>7.78</td>
</tr>
<tr>
<td>Overall acceptability</td>
<td>AGJR</td>
<td>25</td>
<td>8.52</td>
</tr>
<tr>
<td></td>
<td>ARJR</td>
<td>25</td>
<td>7.56</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>8.04</td>
</tr>
</tbody>
</table>

Code: AGJR = Agric Jollof Rice; ARJR = Aroso Jollof Rice
Source: Data output

1st National Conference of WITED, Ilaro Chapter
Table 2 shows descriptive statistics of sensory qualities of the two jollof rice dishes. Sensory attributes of the two different grains were examined based on appearance, colour, texture, taste, aroma, flavour, spreadability and overall acceptability. Mean response of AGJR (8.56, ± 0.651) implies that on average, the analyzed jollof rice type taking “appearance” into consideration were “extremely liked” by the panelists. Although, the ARJR was found to be “very much liked” (7.88, ±1.424) compared to the other. Mean response for colour also indicates that both AGJR and ARJR were “very much liked” (8.40, ±0.645; 7.72, ±1.272). This implies that the two jollof rice dishes were almost of the same colour. Mean response of AGJR (8.28 ± 0.843) implies that on average, the analyzed rice type, taking texture into consideration, was “extremely liked” by the panelists. However, ARJR was found to be “very much liked” (7.48, ±1.503). This indicates that AGJR was found to have a better texture. While considering the taste of the varieties of jollof rice, there is an indication that AGJR (8.44, ±0.712) has a better taste when served compared to the ARGR (7.56, ±1.609), including the aroma (8.32, ±0.802; 7.76, ±1.261; for AGJR and ARJR respectively) as evidenced by majority of the panelists. In addition, the flavour of the different types of jollof rice also shows that AGJR has a better flavour compared to ARJR. The spreadability of both rice indicates that they have the same level of spreadability, although this could be attributed to the expertise of the chef. On overall acceptability, analysis of the mean response shows that AGJR is extremely liked compared to ARJR since their corresponding average value are 8.52 and 7.56 respectively. The 95% confidence interval shows the bound to which the respective mean response of the samples lies. Bar chat for the mean response of the two varieties of rice as measured using appearance, colour, texture, taste, aroma, flavour, spreadability and overall acceptability can be verified in Figure 1.

![Figure 1: Multiple bar chart showing mean response for two different jollof rice](data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAABeAABAMCAAAAB7TvHAAAACXBIWXMAAA7AAAAAM5A2jAAAABl0LCQAAAAABJRU5ErkJggg==)

Source: Data output

<table>
<thead>
<tr>
<th></th>
<th>ANOVA Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sum of squares</td>
</tr>
<tr>
<td>Appearance</td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>5.780</td>
</tr>
<tr>
<td>Within Groups</td>
<td>58.800</td>
</tr>
<tr>
<td>Total</td>
<td>64.580</td>
</tr>
<tr>
<td>Colour</td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>5.780</td>
</tr>
<tr>
<td>Within Groups</td>
<td>49.040</td>
</tr>
<tr>
<td>Total</td>
<td>54.820</td>
</tr>
<tr>
<td>Texture</td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>8.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>71.280</td>
</tr>
<tr>
<td>Total</td>
<td>79.280</td>
</tr>
<tr>
<td>Taste</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>74.320</td>
</tr>
<tr>
<td>Total</td>
<td>84.000</td>
</tr>
</tbody>
</table>

Table 3: ANOVA Result

1st National Conference of WITED, Ilaro Chapter
| Source: Data output |

Testing the significance mean difference of the two samples in addition was adopted using One-way ANOVA. The “between groups” of the ANOVA in Table 3 indicates the source of variation of the considered samples in the study. The F-value of 4.718 (Sig = 0.035 ≤ p-value – 0.05) shows that there is significant mean difference in the jollof made from the two different types of rice taking the respective rice appearance into consideration. The texture test of significance also indicates that there is significant mean difference in the rice type (Sig = 0.25 ≤ p-value – 0.05) made from the two different rice grain considering the texture. The taste (Sig = 0.016 ≤ p-value – 0.05), flavour (Sig = 0.000 ≤ p-value – 0.05), and overall acceptability (Sig = 0.016 ≤ p-value – 0.05) of the jollof made with agric and aroso rice were also found to be statistically significant. The significance of the aforementioned samples of varieties was as a result of the difference in their respective mean response. This implies that the sampled rice can be used to prepare jollof but the agric jollof rice was found to be more preferred to the aroso jollof rice. However, it can be held from the aroma (Sig. 0.068 ≥ p-value – 0.05) and spreadability (Sig = 0.332 ≥ p-value – 0.05) of the two sampled rice that they are not significantly different from one another.

5. CONCLUSION AND IMPLICATION OF FINDINGS

5.1 Conclusion

This study is primarily based on the sensory assessment and acceptability of jollof rice made from two different types of rice grains. It was proven from the result of descriptive analysis that the two sampled rice grains can be used in preparing jollof rice. However, the agric jollof rice was found to be more preferred to aroso jollof rice due to its appearance, texture, taste, and flavour.

It is evidenced in the study that though jollof rice is an indigenous food of West African countries, Asian and European consumers also find the food acceptable. The preference of aroso jollof rice is a pointer to the need to understand customer choice of product in the dining encounter against the trend of serving guests any available product while neglecting customer preference, which may result in lack of customer goodwill (Geng-qing Chi, AbKarim, Gursoy, 2010; Sánchez-Cañizares & López-Guzmán, 2012).

Additionally, the consumption of aroso jollof rice could open a threshold for exploration of forgotten Nigerian dishes for gastronomy tourism implications judging from the tendency of jollof rice consumers seeking for more culinary experience as a way of exploring the culture of the destination. Inbound tourists, according to Nam and Lee (2011), have a way of seeking satisfaction through culinary experience in local restaurants at destinations, which assists in extending visitors’ stay at the destination giving rise to more visitor-spending (Ukabuiwu, et al., 2018). This would create opportunity for more sales and better income generation in local restaurants.

The ease in preparation of jollof rice was also exposed in the study, ranging from the availability of the food ingredients in the local market to the timing of preparation, which gives ample opportunity for making the product available on demand. The local architecture of food production is positively affected through the sale of numerous commodities that are complimentary to the production of the product, which stimulates economic activities within the area (Alam & Sayuti, 2011; Dougherty, Brown & Green, 2013; Jablonski & Schmit, 2016). This situation is expected to create partnership in moving goods and services between sectors, which will assist in generating micro revenue in the sectors having linkages with hospitality and tourism including agriculture (Everett & Slocum, 2013; Hughes & Boys, 2015; Andersson, et al., 2017).

Heritage tourism is also indicated in this study judging from the percentage of African respondents and their level of acceptance of the food product. To this end, the study succeeded in the ‘heritagisation’ of jollof rice as...
an African food product prepared from a traditional perspective, which helps in tourism promotion and regional development with its synergistic approach towards rural entrepreneurship (Bessière, 2013; Bessière & Tibere, 2013; Andersson, et al., 2017; Obiora & Nwokorie, 2018).

5.1 Recommendations

Local rice farmers should take advantage of the prospects created by the apparent demand of the commodity to invest in the production of the species of rice grain locally. This would provide opportunity for job creation in the agricultural sector and further discourage import, thereby improving the local economy.

Culinary entrepreneurs in local restaurants should diversify their vocation using the opportunity created by the acceptance of the local food by inbound tourists to reinvent other local food products and gastronomy tourism towards relevant niche tourism implications.

To ensure customer loyalty and profit maximization, restaurant entrepreneurs should devise a feedback mechanism from their customers. This would assist in ensuring continuous improvement of their products and enhancing word-of-mouth adverts for business sustainability.

Tourism service providers should look inwards on the use of local culinary expertise to advance gastronomy tourism for the local tourism industry. Apart from rejuvenating forgotten ethnic local dishes, it would also create opportunity for heritage cuisine practice and cultural rebirth.

Ethical values in food production and service procedures should be enforced by local restaurant entrepreneurs. This would ensure that the highest standards of global best practices are maintained in the local restaurant industry to further ensure that hygienic and quality jollof rice is produced for sale.

Relevant government agencies and professional associations should create opportunities where culinary professionals could showcase their vocations, in form of food fairs and food festivals. This would create prospects for budding culinary entrepreneurs who will find breakthroughs for their vocation and become employers of labour.

REFERENCES


EFFECT OF FEEDING TIME ON LAYING PERFORMANCE OF BROILER BREEDERS RAISED UNDER TROPICAL ENVIRONMENT

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ABSTRACT
A total of 180 Marshal Broiler breeders within age range 40 to 48 weeks were used to investigate the effect of feeding time on laying performance and survivability. The weights of the birds were equalized and divided on the basis of feeding time into three (3) treatments (3, 5 and 7 AM) for an experimental period of 6 weeks with each treatment consisting of 60 birds. Each treatment was further sub-divided into 3 replicates of 20 birds per replication. Data obtained were subjected to Analysis of Variance in a Completely Randomized Design. Results showed feeding time had no significant (p>0.05) influence on feed intake, feed conversion ratio, average egg laid and average egg mass. However, birds fed at 3 and 5 AM recorded significantly (p<0.05) higher (69.19 and 69.83%, respectively) hen-day egg production percentage than 60.55% recorded in birds fed at 7 AM. Mortality rate was significantly lower in birds fed at 3 AM (14.84%) when compared with 36.28 and 25.31% recorded respectively for birds fed at 5 and 7 AM. Hence, feeding broiler breeders at 3 AM is recommended for optimal egg production and higher survivability rate.

Keywords: Marshal breeders, feeding time, laying performance

1. INTRODUCTION
The production and supply of day-old chicks is very important for the success of the poultry production chain. Commercial operations depend on hatcheries for the supply of day-old chicks while the subsistence farmers hatch their chicks by natural incubation King'ori (2011). Feeding time is a factor that may lead to heat stress, due to the heat increment from exothermic reactions that happen during feed metabolism. Previously, feeding breeders in the late afternoon was a standard procedure, but according to Leeson and Summers (2009) the choice of feeding time for adult breeders can influence egg production and egg size. Wilson and Keeling (1991) also speculated that delaying feeding time (from morning to afternoon) will result in increased transit time of the egg through the oviduct thereby delaying the time of oviposition.
Based on this background, this study aimed to determine the effect of feeding time on laying performance and survivability of broiler breeders raised under tropical environment.

2. MATERIALS AND METHODS
Experimental Site
The research was conducted at Obasanjo Farms Nigeria Ltd. Breeder Farm, Igboora, Oyo State.

Experimental Birds
A total of 180 Marshal Broiler breeders within age range 40 to 48 weeks were equalized randomly and divided on the basis of feeding time into three (3) treatments (3, 5 and 7 AM) with each treatment consisting of 60 birds. Each treatment was further sub-divided into 3 replicates of 20 birds per replication. The birds were housed in battery cages equipped with nipple drinker system. Birds were fed once a day at varying time of feeding and with 135 g of feed per bird per day. Room’s cleaning and disinfection programs were carried out in accordingly. The experiment lasted for a period of six (6) weeks.

Data Collection
Laying performance
Daily records of feed consumed and mortality from the start of the experiment till the end of the experiment was recorded and used for this study.

1. Hen-day production (HDP): This is measured by the ratio of the egg laid in a day divided by the number of birds alive multiplied by 100.
   \[ \text{HDP} = \frac{\text{Egg laid per day}}{\text{No of birds alive}} \times 100 \]
2. Feed Conversion Ratio: This is the ratio of hen-day egg lay to feed (g) consumed,
FCR = \frac{\text{Total feed intake (g)}}{\text{Total egg produced (g)}}

3. **Mortality rate**: This will be the measure of dead birds, which will give an indication of the survivability of a breeder stock.

\[
\text{Mortality} = \frac{\text{No. of breeders that dies}}{\text{Total No. of breeders pen}} \times 100
\]

**Statistical Analysis**

Data obtained were subjected to Analysis of Variance in a Completely Randomized Design. Significantly (p<0.05) different means were separated using Duncan’s multiple range test as contained in SAS (2002).

### 3. RESULT AND DISCUSSION

**Table 1: Effect of Feeding Time on laying performance of Broiler Chicken Breeder reared under tropical environment**

<table>
<thead>
<tr>
<th>Feeding time</th>
<th>Parameters</th>
<th>3 AM</th>
<th>5 AM</th>
<th>7 AM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feed intake (g/b/day)</td>
<td>126.02± 5.59</td>
<td>117.64± 1.20</td>
<td>126.23± 1.09</td>
</tr>
<tr>
<td></td>
<td>Feed conversion ratio</td>
<td>1.95±0.15</td>
<td>1.74±0.05</td>
<td>1.98±0.01</td>
</tr>
<tr>
<td></td>
<td>Average egg laid</td>
<td>90.31±3.89</td>
<td>84.84±4.76</td>
<td>79.69±2.71</td>
</tr>
<tr>
<td></td>
<td>Average egg mass (g)</td>
<td>45.27 ± 3.20</td>
<td>47.81 ± 4.49</td>
<td>38.60 ± 1.31</td>
</tr>
<tr>
<td></td>
<td>Hen-day egg production (%)</td>
<td>69.19 ± 1.10&lt;sup&gt;a&lt;/sup&gt;</td>
<td>69.83 ± 4.05&lt;sup&gt;a&lt;/sup&gt;</td>
<td>60.55 ± 1.65&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Mortality (%)</td>
<td>14.84±9.82&lt;sup&gt;b&lt;/sup&gt;</td>
<td>36.28±3.96&lt;sup&gt;a&lt;/sup&gt;</td>
<td>25.31±2.02&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a,b</sup> Means on the same row having different superscript are significantly (p<0.05) different.

Table 1 shows the effect of feeding time on laying performance of broiler chicken breeder reared under tropical environment. All parameters measured except hen-day egg production and mortality rate were not (p>0.05) significantly different. Birds fed at 3 and 5 AM recorded significantly (p<0.05) higher (69.19 and 69.83%, respectively) hen-day egg production percentage than 60.55% recorded in birds fed at 7 AM. This is in line with reports by Brake (1985) who found a significant interaction between time of oviposition and feeding time and stated that, delaying feeding may delay oviposition; thus reducing the quantity of eggs produced. Mortality rate was significantly (p<0.05) lower in birds fed at 3 AM (14.84%) when compared with 36.28 and 25.31% recorded respectively for birds fed at 5 and 7 AM. This is however in agreement with the reports of Kohne *et al.* (1973) that feeding time may lead to heat stress which increased mortality, due to the heat increment from exothermic reactions happening during feed metabolism.

### 4. CONCLUSION

From this study, it could be concluded that feeding broiler breeders at 3 AM will result in optimal egg production and higher survivability rate of the breeder stock than the 5am and 7am feeding schedule as this will reduce the effect of the increased exothermic heat reaction on the breeder stock.

**References**


ABSTRACT

Schistosomiasis is a parasitic disease caused by flukes (trematodes) of the genus Schistosoma. A survey of the effect of nutrition status on Schistosomiasis among Primary school pupils of St. John’s primary school and Local Authority primary school, Ebute-Igbooro, Yewa North Local government was carried out. The study group was made up of pupils of St John’s Anglican Primary school and Yewa North Local Authority Primary school both in the village. The research was designed as a cohort study to include a baseline examination before treatment and follow up examination 6 and 12 weeks post treatment. Baseline examination included 378 school children with age range 5-12 years in Primary schools. The urine samples were collected and further subjected to microscopic examination to check for the presence of S. haematobium. Height, weight, mid-upper arm circumference were measured and questionnaires were administered to obtain demographic data from pupils. The result indicated that infected children have poor Body mass index (BMI) that showed underweight and poor nutrition status.

Keywords: Schistosomiasis, Trematodes, Demographic, Body mass index (BMI), Schistosoma haematobium

1. INTRODUCTION

Human Schistosomiasis, otherwise known as Bilharzia, is a fresh water snail transmitted intravascular debilitating disease resulting from infection by the parasitic dimorphic Schistosoma trematode worms, which lives in the bloodstreams of humans (Steinmann et al., 2006). Schistosomiasis is a parasitic disease caused by flukes (trematodes) of the genus Schistosoma. Human get infected with this disease when they make contact with cercariae – contaminated water. Prevalence of Schistosomiasis, at present, is still high in sub-Saharan Africa. In 2008, 17.5million people were treated globally for Schistosomiasis 11.7million of those from sub-Saharan Africa (WHO, 2014). Approximately 120million individuals in sub-Saharan Africa have Schistosomiasis-related symptoms while about 20million undergo hardship as a result of chronic presentation of disease (Chitsulo et al., 2000).

Nutrition plays a major role in child physical and cognitive development. The early nutrition has a lot in preparing a child against future illnesses. Schistosomiasis infection has a great impact in suppressing child nutrition whether as direct effects or as a result of hemorrhage that the infection causes which leads to the loss of mineral elements in the body. The situation becomes worse especially in Schistosomiasis endemic area when the average food intake is even lower than the acceptable standard that makes the child develop immunity against arrays of infections.

The knowledge about the Schistosomiasis in the affected area is poor, this is unconnected with inability of the community to have access to standard clinic and other health infrastructure that may aid the eradication of the disease. The source of water both for domestic activities and farming is still the Yewa River; therefore a study of this type will create awareness and can also help in policy formulation in the control of the disease in the community. The study aimed to investigate the morbidity pattern in general and effects of nutrition on the prevalence of the disease in the community.
2. MATERIALS AND METHODS

2.1 STUDY AREA

The study was conducted in Ebute-igbooro, in Yewa North local government area of Ogun state. Yewa River is a popular river that flows round, serve the purposes of domestic and agricultural activities in the village. The village has two basic schools for the children that live in that community, namely St. John primary school and Local authority primary school.

2.2 METHODOLOGY

2.2.1 Parasitological Examination:

Capped urine bottles were labelled, numbered and distributed to the school children. Instruction was given to the children on urine collection. Urine samples were collected from the students and subjected to parasitological examination.

Using the rapid diagnosis test strip (URO-DIP 10 and DUS 10), which was dipped into each urine samples after thoroughly shaken for even distribution of the eggs or particles in the urine. The presence of the microbe and level of presence of the infection was indicated by a colour change. The colour change was read against the readings on the hematocrit container being indicated by the manufacturer.

2.2.2 Microscopic Examination

Urine samples were spun in the centrifuge for five (5) minutes at 5000rpm; the sediment is then poured onto a sterile, clean microscope slide and placed under the microscope. A cylindrical shaped structure with two endings shown in an infected urine indicate the presence of S. haematobium. The number of S. haematobium was counted and recorded.

2.2.3 Anthropometric Evaluation

The anthropometric measurements were carried out according to (Wiener and Lourie, 1969). Weight was measured with scales with 100kg capacities. All children were weighed and weight was recorded. For measurement of height, a tape rule was used to measure their heights. Mid-upper arm circumference was taken with a non-expandable tape measure.

2.3 Data Collection

Questionnaires were given to each pupil and interviews were conducted on each pupil concerning questions relating to their environment, family, feeding habits, nutritional status, health issues and body changes.

3. RESULTS

Table 1: Respondents’ social demographic characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>n= 378</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>224</td>
<td>59.3</td>
</tr>
<tr>
<td>Female</td>
<td>154</td>
<td>40.7</td>
</tr>
<tr>
<td>Age groups (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 3 years</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>4-7 years</td>
<td>114</td>
<td>30.2</td>
</tr>
<tr>
<td>8-11 years</td>
<td>193</td>
<td>51.1</td>
</tr>
</tbody>
</table>
Table 2: Sources of drinking water by the respondents and the infection status

<table>
<thead>
<tr>
<th>Sources</th>
<th>Infectious</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>86 (31.2%)</td>
<td>31 (30.4%)</td>
</tr>
<tr>
<td>F</td>
<td>186 (67.4%)</td>
<td>71 (69.6%)</td>
</tr>
<tr>
<td>Spring water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>117 (42.4%)</td>
<td>49 (48.0%)</td>
</tr>
<tr>
<td>F</td>
<td>155 (56.2%)</td>
<td>53 (52.0%)</td>
</tr>
<tr>
<td>Stream</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>125 (45.3%)</td>
<td>71 (69.6%)</td>
</tr>
<tr>
<td>F</td>
<td>147 (53.3%)</td>
<td>31 (30.4%)</td>
</tr>
<tr>
<td>River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>145 (52.9%)</td>
<td>65 (63.7%)</td>
</tr>
<tr>
<td>F</td>
<td>126 (45.7%)</td>
<td>36 (35.3%)</td>
</tr>
</tbody>
</table>

T=True, F=false.
Whereas there is significant association of river water with infection status, others have no association with infection status.

![Symptoms of schistosome as reported by respondents.](image)

**Fig 1:** Symptoms of schistosome as reported by respondents.

<table>
<thead>
<tr>
<th>BMI</th>
<th>Positive</th>
<th>Negative</th>
<th>Total</th>
<th>Test of Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤18</td>
<td>65 (26%)</td>
<td>185 (74.0%)</td>
<td>250</td>
<td>(x^2 = 1.975)</td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>31 (32.6%)</td>
<td>64 (68.4%)</td>
<td>95</td>
<td>(p &gt; 0.05)</td>
</tr>
<tr>
<td>25-29.9</td>
<td>7 (35%)</td>
<td>13 (65%)</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

4. **DISCUSSION**

Nutritional evaluation of individuals is a complex process. The world health organisation has favoured the use of the anthropometric indices of weight-for-age (WFA), height-for-age (HFA) and weight-for-height (WFH) that are simple to obtain and accurate for the purpose of most studies (WHO, 1995).

An epidemiological survey suggests that the first indication of a nutritional defect and/or infection is weight loss (wasting) followed by retardation in linear growth (Walker et al., 1996). Some common causes are inadequate dietary intake, disease, inadequate health services, unhealthy environment, inadequate household food security and inadequate mother and children caring practices (Smith et al., 2000). In this result, the demographic variables of pupils data were used to evaluate the causes or factors which could be responsible for the low nutritional status of pupils and increase risk of infections in them; children within the age 0-3 years were 15 (3.9%), 4-7 years were 114 (29.9%), 8-11 years were 193 (50.7%), 12-15 years were 54 (14.2%) while 16-
19 years were 2 (5%). In this study, children infected with schistosomiasis were more malnourished than the children without the infection; this was also inline with the work of Zeleke et al (2014). Out of the 378 pupils examined in this study and based on the data obtained from them, percentage of those who wear shoes are 81.6% while those who don’t are 16.5% and others are 7%; pupils who sleep under treated bed net are 61.2%, those who don’t 1.6%; pupils living in earth house are 42.3%, those who don’t are 55.9%, those who have electricity are 74.5%, those without electricity 23.6%; mid upper arm circumference less than 15(<15) are 28.3%, those within the range of 16-18cm are 59.1% and those within range 19-21cm are 11.0%.

From the result, it could be denoted that pupils eat more of carbohydrate or starchy food than they take proteinous food, perhaps some eat these food but not in the adequate proportion which led to a decrease in their blood protein level and increasing the infection status.

Under-nutrition continues to be a major health burden in the developing countries. Since parasitic infections cause anorexia and poor absorption of nutrients and promote the deviation of nutrients to the organism’s defence mechanisms, they contribute to the onset or exacerbation of weight and height deficits (Jardim-Botelho et al., 2008).

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The study concluded that there is a significant effect of nutrition and nutritional status of pupils or individuals on the level of infection. A good nutrition contribute to individuals defence mechanism against infection and a deviation of nutrients to the individuals defence mechanism, contribute to an increase in level of infection and causing a decrease in weight and height of children leading to stunting and wasting.

5.2 Recommendation

In order to increase the feeding habit of parent and children, and level of good living in Ebute-Igbooro, government as well as non–governmental organisations (NGO), should help provide food and portable water with other basic amenities.

A community health campaign and adequate health education should be carried out to make individuals see reasons why they need to eat good food, and most of the good foods used on commercial purposes should also be consumed by them to improve their health status. They should eat more of protein but less of carbohydrate.

Since this is a predominantly childhood infection, children should be educated on the mode of transmission of the disease and the pathology of the disease and therefore encourage them to adopt control measures.

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COMPARATIVE ANALYSIS OF MALE AND FEMALE STUDENTS IN PROGRAMMING ABILITY

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ABSTRACT
The gender gap in the population of the admitted students as it was observed in computer science department in federal polytechnic, ilaro is wide. In 2015, it was 25 male to 7 female, in 2016, it was 37 male to 8 female, in 2017, it was 38 male to 15 female and in 2018, 57 male to 9 female. This variation was thought to be due to lower academic performance of female students. The comparative study of the performance of both male and female students in a programming language (COM113) from the computer science department of the federal polytechnic, ilaro, over a period of four (4) years shows that the performance of the female students is at par with the performance of male students. The results of four sessions were analyzed using the statistical mean and standard deviation. The mean of means for the performance of male and female are 52.82 and 51.38 respectively while the standard deviations are 11.37 and 11.31 for male and female respectively. T-test values of com 113 (from 2015-2018) of male and female students shows a significant difference while the p-value of the t-test is above the 0.005 which shows that there is no statistically significant relationship between the students’ performance in computer programming and the population ratio of male to female.

Key words: gender gap, statistical mean, programing language, T-test, Comparative study.

1. INTRODUCTION

According to Wikipedia, Women in Nigeria have had various challenges in order to obtain equal education in all forms of formal education in Nigeria. Education gives on women the tendency to acquire knowledge, competence with skills. The National Policy on Education states that access to education is a right for all Nigerian children irrespective of gender, religion and disability in other to make sure that there is equal access to education, (Wikipedia). During the advent of computer technology (during the world war II), women formed most of the workforce. Today, when computer is virtually everywhere, the interest of female in computing seems to be diminish. Ates, (2017) said that Women invented the field, Then men pushed them out of it. The contributions of Ada Lovelace, In 1843, Hedy Lamarr,in 1942, Jean Bartik,In 1945–46,Rear Admiral Grace Hopper, In 1952, to mention but few, cannot be over emphasized. These are women who actively worked to invent or co-invent computer technology. As technology and practices altered, the role of women as programmers has changed, and the recorded history of the field has downplayed their achievements (Ates, 2017).

At federal polytechnic, ilaro, the population of the admitted students into the department of computer science over a period of four (4) sessions were examined and the ratio of male to female in 2015/16, 2016/17, 2017/18 and 2018/19 are 4:1, 5:1,3:1 and 6:1 respectively.

From the ratio above, the number of male students out-weighed that of the female students. Could the reason be low academic performance on the part of the female students? The empirical analysis of the performance of male students to female students in programing language courses shows that women are not week academically.

2. LITERATURE REVIEW

Greg and Jesse (1996) said, worldwide, there is a significant discrepancy between the numbers of male and female graduates from computer science programs. The researchers also gave brief analysis of male to female ratio in SUNY Geneseo. The members of the the Computer Science Department informally observed that: although roughly 2/3's of the college's students are women and roughly 1/2 of all students in introductory computer science courses are women, less than 1/4 of the students who graduate with degrees in computer science are women (Greg and ajesse,1996).
According to Korkmaz and Altun (2013) as cited by Akinola (2016), the way Women are represented in the field of Computer Science is not encouraging. One of the several factors that might explain the reason for low participation of women in computing is their attitude toward computing. Programming is not alluring to females. This could be attributed to females' low confidence and programming abilities. Therefore, their attitudes towards programming are more negative than males (Akinola, 2016).

There are a lot of women pursuing various courses in science and engineering over the past decades, but very few of them are among majors and baccalaureate degree holders in fields outside the social, behavior, and life sciences (Fox and Sonnert, 2012). Gender differences in students’ participation and performance in undergraduate education within science and engineering is an important subject in the study of gender and higher education (Fox and Sonnert, 2012).

Gender has been found to influence the academic performance of male and female students, and has in turn called the attention of institutions of higher learning, governments and individuals in recent times, to investigate the extent to which gender influences academic performance (Kwesi, Sam, Osei, and Kattah, 2019). Traditionally, male students’ academic achievement was considered superior to that of female students, especially in Mathematics and Science, because of their higher levels of innate spatial abilities (Benbow & Stanley, 1980), as reported by Kwesi et al. (2019).

Gender studies tend to have implications to support research, curriculum enrichment and redesign, future teaching methods, and the academic study of gender across all disciplines. In the educational setting, results of researches conducted to compare male and female students’ performance inform much about which gender group is failing or succeeding in the discipline under study. The results from gender studies influence teaching methods as subject instructors also play major roles in students’ performances (Kwesi et al., 2019).

In their paper; Gender Differences in Academic Performance in a Large Public University in Turkey, Meltem and Serap (2004), established that despite their lower university entrance scores and under-representation in most departments, female undergraduate students outperform their male counterparts during their college years.

Nnamani and Oyibe, (2016) in their research revealed that both students and teachers’ gender have effects on secondary school students’ mean achievement and recommended that Government should put gender equality in consideration while recruiting teachers.

Wangu, (2014), defined academic performance as the quality and quantity of knowledge, skills, techniques and positive attitudes, behavior and philosophy that students achieve or acquire.

This achievement, according to wangu, (2014) is evaluated by the mark or grade that students attain in a term or education cycle and their level of academic performance is determined by the quality of grades and the number of students that pass.

Simmons (2010) Concluded that the female students reported more positive ratings for academic self-perception and valuing school goals than the male students. Despite these differences, there was no significant difference in the achievement levels of male and female students.

3. RESEARCH METHODOLOGY

Subjects: The subject used for this research is introduction to programming (COM113). ND1 (100 Level) students of Computer Science who are just learning how to program were used because the Students got little or no prior knowledge of computer programming. They were lectured for a period of 10-weeks, including practical classes in this programming Language. Their performance was studied over a period of four (4) semesters (first semester for four years) and the statistical mean and standard deviation was calculated and then compared.

In this work, we try to find out analytically if low population of the female gender will really affect the programming skill ability of female students using the results of introduction to programming (COM113) of first semesters of four (4) sessions and analyzed the performances of male and female students.

3.1 Statement of Hypotheses

H0: There is no statistically significant relationship between the students’ performance in computer programming and the population ratio of male to female.
H1: There is statistically significant relationship between the students’ performance in computer programming and the population ratio of male to female.

3.2 Research Design

The subject used for this research is introduction to programming (COM113). ND1 (100 Level) students of Computer Science who are just learning how to program were used because the Students got little or no prior knowledge of computer programming. They were lectured for a period of 10-weeks, including practical classes in this programming Language. Their performance was studied over a period of four (4) semesters (first semester for four years) and the statistical mean and standard deviation was calculated and then compared. Data collected comprises of the examination score of the students graded 100% as the mark obtainable. The collected data is represented using grouped data as shown in Table 1. Equation (1) (2) (3) and (4) are the formulas of mean, variance, standard deviation and t-test which are the statistical measures used to analyze the collected data.

3.3 Data Collection Procedures

The data of students in introduction to programming categorized under male and female students were obtained directly from the result sheets for the years 2015-2018 from the department of computer science, federal polytechnic, ilaro. These categories were used as a measure of academic performance.

This study made use of secondary data in the form of the scores of students from result score sheets (RSS) obtained from the department of computer science, the federal polytechnic, ilaro for the years 2015-2018. Secondary data analysis can save time that would otherwise be spent on collecting data.

3.5 Data Processing and Analysis

In order to prove our hypothesis right or wrong, the research questions that guided the study, the data that was obtained from the department was processed using the statistical data tools of the Microsoft excel. A combination of descriptive and inferential statistics, were used to analyse the data to provide results. The hypothesis focused on determining whether there is a statistically significant difference in the academic performance of male and female students in introduction to programming, (programming ability) for the years 2015-2018 and was analysed with the use of independent samples t-test.

The statistical tools used are the formulae for mean score, standard deviation, t-value and degree of freedom which are:

\[ \text{Mean} (\overline{X}) = \frac{\sum X}{f} \]  \hspace{1cm} (1)

\[ \text{Variance} (\sigma^2) = \frac{\sum (X - \overline{X})^2}{f-1} \] \hspace{1cm} (2)

\[ \text{Standard Deviation} = \sqrt{\sigma^2} \] \hspace{1cm} (3)

Where \( \overline{X} \) =the Mean and X= class mid-mark

\[ t-value = \frac{\text{mean1} - \text{mean2}}{\sqrt{\frac{(\text{Var1})^2 + (\text{Var2})^2}{n1 + n2}}} \] \hspace{1cm} (4)

Here mean1 and mean2 = {Average values of each of the sample sets}

Var1 and Var2 = {Variance of each of the sample sets}

n1 and n2 = {Number of records in each sample set}
4. RESULTS AND DISCUSSION

4.1 Demography of Respondents

The gender of the introduction to programming students was the only demographic variable that was collected. This was meant to give a clear indication of the total number of male and female students who sat for the exams in the years, 2015, 2016, 2017 and 2018. The results that were obtained are presented in Table 1.

Table 1: Frequency distribution of the performances of male and female students over a period of 4 years

<table>
<thead>
<tr>
<th>CLASS VALUE</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 113</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>0-39</td>
<td>37</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>40-44</td>
<td>42</td>
<td>9</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>45-49</td>
<td>47</td>
<td>6</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>50-54</td>
<td>52</td>
<td>1</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>55-59</td>
<td>57</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>60-64</td>
<td>62</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>65-69</td>
<td>67</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>70-74</td>
<td>72</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>75-100</td>
<td>77</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>27</td>
<td>7</td>
<td>37</td>
<td>8</td>
</tr>
</tbody>
</table>

Total number of 34 students were admitted to the department of computer science in 2015, the total number of students who sat for COM 113 (introduction to programming), which included 27 (79%) male students and 7 (21%) female students. From Table 1 above, 2018 recorded the highest number of students who sat for the exam as compared to the other years under study. The reason for this was the increments in the number of streams approved for the department by the NBTC. The number of students who sat for the exam in the respective years is as indicated in the table 1. There was increase in the number of male students from 2015 to 2016 by percent (37%) and the female students had fourteen percent increase (14%). From 2016 to 2017 male students recorded a 3% increase in the number and the number of female students also increased by 87%. Likewise 2017 to 2018, the number of male students increased by 50% and the number of females also decreased by 40%.

From all the respective years studied, the population of male students dominated that of female students. Out of a total population of 198 from the department, the male students represented 159 and the female students represented 39, showing clearly that there are more male students studying computer science than female students in the computer science department of the federal polytechnic, Ilaro.

Data was collected on students’ scores in COM 113 with respect to the four year period and was analysed with the use of means and standard deviations. Table 2 presents the results that were obtained.
Table 2: Mean scores and the standard deviation of students marks in Com113 (2015-2018)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Mean of Mean/SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENDER (MEAN SCORE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td>50.26</td>
<td>54.43</td>
<td>49.24</td>
<td>57.35</td>
<td>52.82</td>
</tr>
<tr>
<td>FEMALE</td>
<td>47.00</td>
<td>50.75</td>
<td>51.33</td>
<td>56.44</td>
<td>51.38</td>
</tr>
<tr>
<td>GENDER (STANDARD DIV)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td>11.00</td>
<td>13.10</td>
<td>10.44</td>
<td>10.93</td>
<td>11.37</td>
</tr>
<tr>
<td>FEMALE</td>
<td>12.91</td>
<td>12.46</td>
<td>9.42</td>
<td>10.44</td>
<td>11.31</td>
</tr>
</tbody>
</table>

From the table of the statistical mean and the deviation above (table 2), the performance of female students seems averagely at par with male. This is an indication that the female performance in computer programming is not bad when compared with their male students.

Though the mean of MALE students is higher than that of FEMALE students (except in 2017/18), we cannot conclude that all the students have an average score around the calculated mean since the variance of MALE is significantly higher than FEMALE (with the exception of the year mentioned above). Is this difference by chance or do differences really exist in the overall population of all the performances received in the class? We establish the problem by assuming the null hypothesis that the mean is the same between the two sample sets and conduct a t-test to confirm if the hypothesis holds true.

Table 3: F-Test Two-Sample for Variances

<table>
<thead>
<tr>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>51.62962963</td>
</tr>
<tr>
<td>Variance</td>
<td>121.011396</td>
</tr>
<tr>
<td>Observations</td>
<td>27</td>
</tr>
<tr>
<td>Df</td>
<td>26</td>
</tr>
<tr>
<td>F</td>
<td>0.726068376</td>
</tr>
<tr>
<td>P(F&lt;=f) one-tail</td>
<td>0.260769008</td>
</tr>
<tr>
<td>F Critical one-tail</td>
<td>0.404185947</td>
</tr>
</tbody>
</table>

Table 4: t-Test: Two-Sample Assuming Equal Variances

<table>
<thead>
<tr>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>51.62962963</td>
</tr>
<tr>
<td>Variance</td>
<td>121.011396</td>
</tr>
<tr>
<td>Observations</td>
<td>27</td>
</tr>
<tr>
<td>Pooled Variance</td>
<td>129.5717593</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>129.5717593</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 5: The p-values of the f-test and t-test (2015-2018).

<table>
<thead>
<tr>
<th>YEAR</th>
<th>F-Test Two-Sample for Variances</th>
<th>t-Test: Two-Sample Assuming Equal Variances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F-Test</td>
<td>P-value</td>
</tr>
<tr>
<td>2015</td>
<td>0.726</td>
<td>0.26</td>
</tr>
<tr>
<td>2016</td>
<td>1.105</td>
<td>0.49</td>
</tr>
<tr>
<td>2017</td>
<td>1.228</td>
<td>0.35</td>
</tr>
<tr>
<td>2018</td>
<td>1.096</td>
<td>0.49</td>
</tr>
</tbody>
</table>

From table 5 above, the p-value associated with the test for Two-Sample for equality of Variances. These p-values are more than 0.005 which shows that the variances can be assumed to be equal. Because of this assumed equality of variance, we proceeded to performing the t-test on each of the year performance. Since the p-values of the t-test are each more than 0.005, then the null hypothesis can be adopted while the alternative hypothesis is rejected. The results show that there is no statistically significant relationship between the students’ performance in computer programming and the population ratio of male to female.

5. CONCLUSION

Truly the way Women are represented in the field of Computer Science is not encouraging. Their attitudes towards programming are believed to be more negative than males. Our results in these research shows that there is no statistically significant difference in the performance of male and female student. There might be other factors, not covered by this research, which brings about the disparity in te population of male and female. This factor may have been the reason why the population of male students is so much higher than that of their female counterpart in the department of computer science, federal polytechnic, ilaro. Probability test (p-test) of 0.005 was used to test how significant is the difference in the performance of the two genders and the result absolutely shows no difference. 0.34, which is the smallest probability test value got from te table 5above is a large value of probability in statistics. The population we studied was restricted to students in a programming language (COM113) in the department of computer science federal polytechnic, ilaro. Finally, the study revealed that the performance in computer programming in computer science department of the federal polytechnic is not gender sensitive and the low population of female students studying computer science is not as a result of weakness in programming ability.

REFERENCES


Wangu, M.J,(2014). The Impact of Gender Differences On Student’s Academic Performance In Secondary Schools In Ndumberi Division, Kiambu County, Kenya In Science Subjects And Languages.

ABSTRACT
The mixture of Cowpea and Bambara groundnut flour for Ekuru production was evaluated. The analysis carried out include functional properties and sensory evaluation. Different ratio of Cowpea and Bambara groundnut flour were measured. The composition include 100% Cowpea, 100% Bambara groundnut, 80:20, 20:80, 50:50 and 60:40 Cowpea:Bambara groundnut flour. Mixtures of Cowpea and Bambara groundnut flour were significantly different in their water absorption capacity, oil absorption capacity, bulk density, dispersibility, swelling power and solubility (p>0.05). Ekuru made from 20% Bambara groundnut and 80% Cowpea was the most acceptable.

KEYWORDS: Cowpea, Bambara groundnut, Ekuru.

1. INTRODUCTION
Bambara groundnut (Vigna subterranea (L.) Verdc.) is a pulse with subterranean fruit-set and small holders cultivate them (Linnenann & Azam-Ali, 1993). The crop is wide spread in the south of the sahara (Ocran et al., 1998). Bambara groundnut is not attacked by pests and disease in any of the production regions. However, in moist conditions it may be susceptible to various fungal diseases (Baudoin & Mergeai, 2001). Bambara groundnut is a popular crop in Sub-Saharan Africa. It is highly nutritious and also plays important roles in people’s diet. The seed contains about 63% carbohydrate, 19% protein and 6.5% oil (Goli, 1997).

Cowpeas are grown widely in savannah regions of the tropics and sub-tropics, especially in western and central African countries. They are also cultivated extensively in California, the southeastern United States and Puerto Rico. Nigeria is currently the world’s largest cowpea producer accounting for about 22% of total production, followed by Brazil, which produces around 10% (IITA, 2007). Depending on the specific cultivar, the pods can be curved, straight or even coiled, and the seeds may be solid colours (red, black, brown, tan or white) or speckled, spotted, or marbled. The seeds vary in shape from kidney-shaped to round, depending on how tightly packed they are in the pod (IITA 2007). The family is called Fabaceae, the subfamily, Faboidea, the genus and species is called Vigna unguiculata. The common names are cowpea, black-eyed pea, black-eyed bean, crowder pea, southern pea, field pea, china bean (IITA, 2007). Cowpea contains around 25% protein and are low in fat. As with most legumes, they are poor in some of the sulphur-containing amino acids needed for a complete protein; however, the amino acids in cowpeas are complemented by those found in cereal grains. They are also an excellent source of fibre, calcium, folic acid and vitamin A (IITA, 2007).

Ekuru is another cowpea based staple food consumed in Nigeria and in some other West African countries. It is a popular kind of food in Southern and Western part of Nigeria where it is used as a culture and traditional food by the people (Adedokun et al., 2014). It serves as a nutritional food in traditional, cultural and religious functions especially among the Yoruba’s. Ekuru can be eaten with prepared sauce made of spices and seasoning or vegetable soup. However, most people prefer consuming it with eko or agidi.

This paper aims at solving the underutilization of Bambara groundnut in Nigeria and also improving the nutritional quality of Bambara groundnut fortifying with Cowpea. The problem came as a result of Bambara groundnut grown extensively in Nigeria but is one of the underutilized legume in Nigeria, hence the need for its processing. Research shows that Bambara groundnut is seasonal, hence processing it into raw materials will increase its availability and the shelf life. Protein malnutrition coupled with calorie deficiency is widespread in many developing countries. The legumes including pulses and beans are important dietary foodstuff. Bambara groundnut is a source of protein and Cowpea is also a source of protein. In view of improving food security and nutritional wellbeing of the people that rely on Bambara groundnut and Cowpea, improving the nutritional quality of Bambara groundnut fortifying with Cowpea is necessary.
The key objectives here are to determine the functional properties of Bambara groundnut and Cowpea blends and to determine the Sensory quality of Ekuru prepared from Bambara groundnut and Cowpea blends.

2. METHODOLOGY

2.1 Source of samples
Bambara groundnut and Cowpea were purchased from Kuto market, Abeokuta, Ogun state, Nigeria.

2.2 Preparation of flour samples
The samples were prepared according to the method described by Olapade & Adetuyi (2007), and Odedeji & Oyeleke (2011).

2.3 Production of Bambara groundnut flour
Bambara groundnut was sorted to remove dirt. It was then soaked for 9 hours and dehulled until the seed coat loosened. The loosened coats were floated off in water while the dehulled cotyledons were drained properly and dried in an oven at 65°C for 23 hours. The dried bambara groundnut were milled in an attrition mill and then sieved and packaged in high density polyethylene bag and tightly sealed until needed. Olapade & Adetuyi (2007).

2.4 Production of Cowpea flour
Cowpea was sorted to remove dirt. It was then steeped for 30 mins and the hull was removed. The dehulled cowpea was dried in an oven at 70°C for 9 hours. The dried cowpea was milled and sieved and later packaged in high density polyethylene bag and tightly sealed until needed. Odedeji & Oyeleke (2011).

2.5 Production of Ekuru
Cowpea flour was mixed with Bambara flour thoroughly in a mixing bowl using a wooden spatula. 100ml of warm water was then added and mixed thoroughly to form a smooth paste after which a big stainless spoon was used to scoop the mixed sample into a nylon, packaged and steam cooked for about 40 minutes. The samples were left for cooling. (Ogundele et al., 2015).

2.6 Functional Properties of Bambara groundnut and Cowpea blends
1. Water absorption capacity
2. Oil absorption capacity
3. Swelling power and solubility
4. Bulk density
5. Dispersibility

2.6.1 Water absorption capacity
Water absorption of flour was measured according to the centrifugation method described by Onwuka, (2005). 1g of sample was weighed in a centrifuge tube and 10ml of water was added and mixed thoroughly. The dispersion was allowed to stand for 30 mins, followed by centrifugation for 15 mins at 3000 rpm. The sample was re-weighed, the amount of water retained in the sample was recorded as weight gained. The water absorption capacity (WAC) was calculated.

2.6.2 Oil absorption capacity
Oil absorption capacity was also determined using the method described by Onwuka, (2005). 1g of sample was mixed with 6ml of corn oil in pre-weighed centrifuge tubes. The content was stirred for 1 minute with a thin brass wire to dispense the sample evenly in the oil. After a holding period of 30 minutes, the tubes were centrifuged for 25 minutes to drain the oil prior to reweighing. Oil absorption capacity (OAC) was weighed as weight of oil bound per weight of the sample on a dry basis.

2.6.3 Swelling power and solubility
This was determined by the method described by Oladele and Aina (2007). One gram of the flour was mixed with 10ml of distilled water in a centrifuge tube and heated at 80 °C for 30 minutes. This was continuously shaken during the heating period. The tube was removed from the bath, wiped dry, cooled to room temperature (28 °C) and centrifuged for 15 mins at 2200 rpm. The supernatant was evaporated, and the dried residue weighed to determine the solubility. The swollen sample (paste) obtained from decanting supernatant was also weighed to determine the swelling power. Swelling power was calculated as weight of the paste/weight of dry sample.
2.6.4 Bulk density
Bulk density was done according to the method of Asoegwu et al. (2006). A known amount of sample was weighed into 50ml graduated measuring cylinder. The sample was packed by gently tapping the cylinder on the bench top from a height of 5cm. The volume of the sample was recorded.

\[
\text{Bulk density} = \frac{\text{Weight of Sample g/ml or g/cm}^3}{\text{Volume of Sample after tapping}}
\]

2.6.5 Dispersibility
This was determined by the method described by Kulkarni (1991). 10grams of flour was suspended in 100ml measuring cylinder and distilled water was added to reach a volume of 100ml. The set up was stirred vigorously and allowed settling for 3hrs. The volume of settled particles was recorded and subtracted from 100. The difference was reported as percentage dispersibility.

2.7 Sensory Evaluation
The Ekuru samples were served, coded and presented to a set of panel of judges who were familiar with the product for sensory evaluation. The personnel scored the color, flavour, taste, texture and overall acceptability. Acceptability test was conducted with 50 panelists who evaluated the sensory quality of Ekuru using A nine (9) point Hedonic Scale 1 to 9 representing.

2.8 Statistical Analysis
All data obtained in this study were analyzed statistically by analysis of variance (ANOVA) with the application of Duncan’s multiple range tests using Statistical package for Social Sciences (SPSS).

3. RESULTS AND DISCUSSION

3.1 Functional Properties

Table 1: Functional properties of Cowpea and Bambara groundnut Blends

<table>
<thead>
<tr>
<th>Sample</th>
<th>Water absorption capacity (g/g)</th>
<th>Oil absorption capacity (g/g)</th>
<th>Bulk density (g/cm(^3))</th>
<th>Dispersibility (%)</th>
<th>Swelling power (%)</th>
<th>Solubility (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C100</td>
<td>2.80±0.01(^{bc})</td>
<td>4.79±0.01(^{c})</td>
<td>1.65±0.01(^{bc})</td>
<td>81.50±0.50(^{a})</td>
<td>4.78±0.01(^{ad})</td>
<td>26.50±0.50(^{b})</td>
</tr>
<tr>
<td>B100</td>
<td>2.50±0.07(^a)</td>
<td>4.92±0.03(^d)</td>
<td>1.68±0.01(^{d})</td>
<td>87.50±0.50(^{a})</td>
<td>3.90±0.02(^{a})</td>
<td>32.50±2.50(^{c})</td>
</tr>
<tr>
<td>C80B20</td>
<td>2.84±0.07(^{bc})</td>
<td>4.72±0.02(^{c})</td>
<td>1.44±0.01(^{ab})</td>
<td>84.00±1.00(^{b})</td>
<td>3.91±0.02(^{a})</td>
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<tr>
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<td>2.79±0.03(^{a})</td>
<td>4.35±0.01(^{a})</td>
<td>1.43±0.01(^{a})</td>
<td>85.00±1.00(^{a})</td>
<td>4.96±0.01(^{e})</td>
<td>28.00±1.00(^{b})</td>
</tr>
<tr>
<td>C50C50</td>
<td>2.69±0.01(^{b})</td>
<td>4.64±0.01(^{b})</td>
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<td>23.50±1.50(^{b})</td>
</tr>
<tr>
<td>C60B40</td>
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<td>4.33±0.01(^{c})</td>
<td>1.45±0.01(^{b})</td>
<td>82.00±1.00(^{b})</td>
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</tr>
<tr>
<td>LSD</td>
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</tr>
</tbody>
</table>

Values with the same superscript in the same column are not significantly different (p>0.05), values are mean±standard deviation of duplicate determinations, LSD=least significant difference. **Key:** C100:100% cowpea, B100:100% Bambara groundnut, C80B20:80% cowpea+20% Bambara groundnut, C20B80:20% cowpea+80% Bambara groundnut, C50B50:50% cowpea+50% Bambara groundnut, C60B40:60% cowpea+40% Bambara groundnut.

From Table 1, B100 had the highest dispersibility while C100 had the least and although there was no significant difference in the dispersibility of C20B80, and C50B50. C20B80 had better swelling power while C50B50 had the least swelling power. Swelling power related often to their protein and starch content (Woolfe, 1992). Higher protein content in flour may cause the starch granules to be embedded within a stiff protein matrix, and which subsequently limits the access of the starch to water and restricts the swelling power (Aprianita et al., 2009). The amylopectin is primarily responsible for granule swelling; the high content in amylopectin in composite flour with higher level of sweet potato starch would increase the swelling power of composite flour (Tester & Morrison, 1990). Moorthy & Ramanujam (1986) reported that the swelling power of granules is an indication of the extent of associative forces within granule”. As a result of swelling there is an increment in the solubility as reported by (Akubo, 1997). B100 was more soluble although there was no much disparity in the solubility of C100, C80B20, C20B80, and C60B40.
3.2 Sensory Characteristics of Ekuru
The sensory characteristics of Ekuru are shown in Table 2, significant difference (p<0.05) was observed between ekuru made from cowpea and bambara groundnut blends with respect to taste, texture, flavour and overall acceptability. It was observed that colour had no significant difference (p<0.05). Furthermore, the mean response of the hedonic scale test shows that colour, taste, texture, flavour and overall acceptability were liked slightly. Ekuru made from 20% Bambara groundnut and 80% Cowpea was the most acceptable.

<table>
<thead>
<tr>
<th>Table 2: Sensory characteristics of Ekuru made from Cowpea and Bambara groundnut Blends</th>
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</thead>
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<tr>
<td>Flour blend</td>
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</tr>
<tr>
<td>B100</td>
</tr>
<tr>
<td>C80B20</td>
</tr>
<tr>
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<td>C60B40</td>
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<tr>
<td>LSD</td>
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</table>

Values with the same superscript in the same column are not significantly different (p>0.05), values are mean±standard deviation of duplicate determinations, LSD=least significant difference.

Key: C100:100% cowpea, B100:100% Bambara groundnut, C80B20:80% cowpea+20% Bambara groundnut, C20B80:20% cowpea+80% Bambara groundnut, C50B50:50% cowpea+50% Bambara groundnut, C60B40:60% cowpea+40% Bambara groundnut.

4. CONCLUSION AND RECOMMENDATION
4.1 Conclusion
From the result, it was found that Bambara groundnut flour increased dispersibility, swelling power and solubility of Cowpea-Bambara groundnut blends significantly. The mixtures of Cowpea and Bambara groundnut flour at 80% to 20% gave the most acceptable steamed paste.

4.2 Recommendation
It is recommended that increased efforts should be made to encourage the cultivation of Bambara groundnut as well as its consumption/utilization in order to help curb food insecurity. Further work should also be carried out in the identification and characterization of the micro-organisms involved during the processing of bambara groundnut flour. More research should be intensifying in the extension of shelf-life of the bambara groundnut composite flour in order to ascertain its storage stability. There is need to research into the mineral content, anti-nutritional properties and amino acid analysis of bambara groundnut fortification. There is need to encourage large scale production of Bambara groundnut in order to combat the problem of proteinous food shortage in under developing countries where animal protein is costly.

REFERENCES


ABSTRACT

Poultry manure contains appreciable amounts of nutrients required by plants. It decomposes in the soil, releasing for nutrients crop uptake. Field experiment was conducted at the Federal University Agriculture, Abeokuta, to determine poultry manure rate and population of okra that gives optimal yield in 'Egusi' melon-okra intercrop. The experiment was carried out using Randomized Complete Block Design (RCBD) in a split plot arrangement, replicated three times. Poultry Manure rate (0, 5 and 10 t/ha) was the main plot treatment and okra population (25,000, 33,333 and 50,000 plants/ha, including Sole Okra of 55,555 and Sole Egusi melon of 10,000 plants/ha) was the subplots treatment. Plot size was 4 x 3 m, with 2 m margin round each plot. Okra yield was significantly affected by poultry manure rate and plant population but not their interactions. Application of 10 t/ha PM produced significantly (P≤0.05) taller plants, more leaves and branches/plant, higher leaf area index and pod yield/ha than either 0 or 5 t/ha. Okra intercropped at 25,000 plants/ha grew significantly taller, with more branches and leaves/plant, and higher leaf area index than either 33,333 or 50,000 plants/ha while plants at 50,000 plants/ha had a higher pod yield/ha than either 33,333 or 50,000 plants/ha. For optimal yield of ‘Egusi’ melon-okra intercrop, it is appropriate to apply 10 t/ha PM with 50,000 plants/ha of Okra.

Key words: Poultry manure (PM), Intercrop, Nutrient, Yield.
parameters for okra were taken on weekly basis from 2 to 12 WAP. Parameters taken for okra include: Plant height, Leaf Area Index (cm²). Yield Parameters; Weight/Pod (g), Yield/plant. Statistical analysis of the data was carried out subjecting the data to Analysis of Variance (ANOVA) using GENSTAT Discovery Statistical package. Means separation was carried out using Least Significant Difference (LSD) at 5% probability level (p < 0.05).

RESULT.

Total rainfall observed during the period of the experiment from May to November was 528.9 mm. The peak of rainfall was in June (164.9mm) while the lowest monthly rainfall was in August (29.4 mm). Maximum temperature (May to November) ranged from 30°C to 34°C while minimum temperature ranged from 22°C to 24°C. Highest temperature during the period was 33.5°C in November while the lowest temperature was 22.1°C in August. Highest relative humidity during this period was 73% in July, while the lowest was 61.9% in May. (Table 1). The soil was almost neutral (7.20) with organic carbon and nitrogen contents of 23.00 and 2.00 g/kg, respectively (Table 2). Available P was 5.20 mg/kg and exchangeable K was 2.31 cmol/kg. (Table 2). The manure was almost neutral (7.55) with an organic carbon and nitrogen contents of 53.20 and 4.60 g/kg, respectively. The P content was 50.5 mg/kg (Table 3).

3.1 Okra Vegetative Growth

Okra plant height was affected by poultry manure rate and okra population. Between 2 and 12 Weeks After Planting (WAP), plants that received 10 t/ha poultry manure (PM) were significantly taller than plants that received 5 t/ha and 0t/ha. The effect of population on Okra plant height, all through the period of observation, was significant. Sole Okra plant with population of 55,555 plants per hectare was the highest and was significantly taller than intercrop treatments (Table 4). The interaction of poultry manure and population on okra plant height was significant only at 6 to 12 WAP. (Table 6).

Plants that received 10 t/ha PM produced significantly more leaves (19.17) per plant all through the period of observation than plants fertilized with 5 t/ha (16.83 leaves) and 0 t/ha (14.17 leaves). Population affected number of Okra leaves/plant significantly all through the period of observation. Sole Okra plants had significantly more leaves (25.53 leaves) than from intercropped plants (Table 5). The interaction of manure and population on number leaves all through the period of observation was significant except at 10 weeks after planting. Plants that received 10 t/ha PM with intercropped okra population of 25,000 plants/ha had more leaves. (Table 6) Poultry Manure was not significant on the leaf area index (LAI) of Okra plants, except at 12 weeks after planting. Application of 10 t/ha PM gave the highest leaf area index. The effect of population on leaf area index was significant all through the period of observation. (Table 7).

3.2 Flowering and Fruiting Attributes of Okra

Manure and population had effect on number of days to first flowering; plants that received 10 t/ha poultry manure flowered earlier (45 days) compared to other rates. Sole Okra flowered earlier (48 days) than intercropped plants. 50% flowering was attained from 48–53 days; there was significant effect of manure on 50% flowering. Sole okra flowered earlier compared to intercropped plants. (Table 8)

First pod harvest was attained from 56-60 days. Manure was significant on days to first pod harvest; sole crop okra crop was harvested earlier compared to intercrop. Manure rate was similar on okra weight/pod. Weight/pod of intercropped okra plant was lower compared to sole crop (Table 8). Plants that received 10 t/ha poultry manure had significantly higher yield/plant (187.90 g/plant) compared to 5 t/ha (181.20 g/plant), and 0 t/ha (161.00 g/plant) t/ha. Okra yield/plant was reduced with intercrop compared to sole crop. (Table 8)

Effect of manure was similar on number of pods/plant. Sole crop had higher value compared to intercrop. Population and spacing were not significantly different on number of harvest times. (Table 8)
Table 1: Weather data during the Experimental period (January to December)

<table>
<thead>
<tr>
<th>Month</th>
<th>Total Rainfall (mm)</th>
<th>Relative Humidity (%)</th>
<th>Temperature Maximum</th>
<th>Temperature Minimum</th>
</tr>
</thead>
<tbody>
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<td>January</td>
<td>0.00</td>
<td>47.70</td>
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<td>20.50</td>
</tr>
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<td>February</td>
<td>51.30</td>
<td>61.40</td>
<td>34.30</td>
<td>24.60</td>
</tr>
<tr>
<td>March</td>
<td>66.80</td>
<td>60.40</td>
<td>35.30</td>
<td>25.10</td>
</tr>
<tr>
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</tr>
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<td>May</td>
<td>60.40</td>
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<td>32.80</td>
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</tr>
<tr>
<td>June</td>
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<td>22.80</td>
</tr>
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<td>65.60</td>
<td>73.00</td>
<td>31.50</td>
<td>22.80</td>
</tr>
<tr>
<td>August</td>
<td>29.40</td>
<td>70.30</td>
<td>29.50</td>
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<td>September</td>
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<td>71.90</td>
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</tr>
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<td>October</td>
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<td>69.20</td>
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<td>November</td>
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<td>62.30</td>
<td>33.50</td>
<td>23.80</td>
</tr>
<tr>
<td>December</td>
<td>56.70</td>
<td>36.10</td>
<td>33.50</td>
<td>19.30</td>
</tr>
<tr>
<td>Total</td>
<td>772.70</td>
<td>747.80</td>
<td>392.40</td>
<td>275.10</td>
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</table>

Source: Metrological Station, Federal University of Agriculture, Abeokuta

Table 2: Soil chemical analysis.

<table>
<thead>
<tr>
<th>Soil chemical analysis</th>
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<td>Organic Carbon (g/kg)</td>
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<tr>
<td>Nitrogen (g/kg)</td>
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<tr>
<td>Available P (mg/kg)</td>
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<tr>
<td>Exchangeable K+ (cmol/kg)</td>
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<td>Mg^2+</td>
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<td>H+ (cmol/kg)</td>
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<td>Base saturation</td>
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<td>Mn (mg/kg)</td>
<td>178.20</td>
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<td>Fe (mg/kg)</td>
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<td>Zn (mg/kg)</td>
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<td>Cu (mg/kg)</td>
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Table 3: Manure chemical analysis

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<td>Nitrogen (g/kg)</td>
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<tr>
<td>Calcium (g/kg)</td>
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<tr>
<td>Magnesium (g/kg)</td>
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</table>
Table 4: Plant Height of Okra as Affected by Poultry Manure rate and Okra Population

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<th>Treatments</th>
<th>Plant height</th>
<th>Plant height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weeks After Planting</td>
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</tr>
<tr>
<td></td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Manure (t/ha)</td>
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<tr>
<td>0</td>
<td>5.25</td>
<td>14.40</td>
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<tr>
<td>5</td>
<td>6.50</td>
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<tr>
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<td>Population</td>
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<tr>
<td>Sole</td>
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</tr>
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<tr>
<td>‘Egusi’ melon-Okra (33,3333)</td>
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<tr>
<td>LSD Interaction</td>
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</table>

Table 5: Number of leaves of Okra as affected by poultry manure rate and okra population

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<tr>
<th>Treatment</th>
<th>Number of Leaves Weeks After Planting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Number of leaves Manure(t/ha)</td>
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<td>0</td>
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Table 6: Interaction of Manure and Okra population on Plant height and Number of leaves

<table>
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Table 7: Leaf Area Index of Okra as influenced by Manure and Population.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Leaf Area Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weeks After Planting</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Manure(t/ha)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0.18</td>
</tr>
<tr>
<td>5</td>
<td>0.35</td>
</tr>
<tr>
<td>10</td>
<td>0.44</td>
</tr>
<tr>
<td>LSD</td>
<td>ns</td>
</tr>
</tbody>
</table>

Population

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Leaf Area Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weeks After Planting</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Sole</td>
<td>0.57</td>
</tr>
<tr>
<td>‘Egusi’ melon-Okr (55,555)</td>
<td>0.30</td>
</tr>
<tr>
<td>‘Egusi’ melon-Okr (33,333)</td>
<td>0.23</td>
</tr>
<tr>
<td>‘Egusi’ melon-Okr (25,000)</td>
<td>0.20</td>
</tr>
<tr>
<td>LSD</td>
<td>0.134</td>
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</table>

LSD Interaction

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Leaf Area Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weeks After Planting</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td>LSD</td>
<td>ns</td>
</tr>
</tbody>
</table>
Table 8: Yield and Yield Components of Okra

<table>
<thead>
<tr>
<th>Manure (t/ha) Treatments</th>
<th>Days to first Flw</th>
<th>Days to 50% Flw</th>
<th>Days to Ist Pod</th>
<th>No of Hvst time</th>
<th>No of Pods/plt</th>
<th>Pod yield/plt</th>
<th>Pod yield/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>50.25</td>
<td>55.25</td>
<td>60.58</td>
<td>9.50</td>
<td>10.38</td>
<td>161.00</td>
<td>5.44</td>
</tr>
<tr>
<td>5</td>
<td>48.00</td>
<td>52.75</td>
<td>57.92</td>
<td>9.583</td>
<td>10.78</td>
<td>181.20</td>
<td>6.47</td>
</tr>
<tr>
<td>10</td>
<td>45.75</td>
<td>50.75</td>
<td>56.25</td>
<td>9.50</td>
<td>11.50</td>
<td>187.90</td>
<td>6.55</td>
</tr>
<tr>
<td>LSD</td>
<td>0.567</td>
<td>1.388</td>
<td>2.348</td>
<td>ns</td>
<td>ns</td>
<td>13.49</td>
<td>0.621</td>
</tr>
<tr>
<td>Population</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sole</td>
<td>48.67</td>
<td>48.67</td>
<td>55.67</td>
<td>48.67</td>
<td>15.83</td>
<td>236.70</td>
<td>8.68</td>
</tr>
<tr>
<td>‘Egusi’ melon-Okra (55,555)</td>
<td>54.56</td>
<td>54.56</td>
<td>59.44</td>
<td>54.56</td>
<td>9.74</td>
<td>156.50</td>
<td>5.22</td>
</tr>
<tr>
<td>‘Egusi’ melon-Okra (33,3333)</td>
<td>54.56</td>
<td>54.56</td>
<td>59.44</td>
<td>54.56</td>
<td>9.74</td>
<td>156.50</td>
<td>5.22</td>
</tr>
<tr>
<td>‘Egusi’ melon-Okra (25,000)</td>
<td>53.89</td>
<td>53.89</td>
<td>58.22</td>
<td>53.89</td>
<td>11.21</td>
<td>192.20</td>
<td>4.81</td>
</tr>
<tr>
<td>LSD</td>
<td>0.495</td>
<td>0.595</td>
<td>1.583</td>
<td>0.415</td>
<td>2.145</td>
<td>23.41</td>
<td>0.717</td>
</tr>
<tr>
<td>LSD Interaction</td>
<td>0.845</td>
<td>1.450</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>39.15</td>
<td>ns</td>
</tr>
</tbody>
</table>

4 DISCUSSION

This study has established that intercropping okra with ‘Egusi’ melon, fertilized with Poultry Manure has high prospects and potentials in the humid tropics. The observed differences in Okra plant height corroborated the reports of Ajari et al., (2003); Saidu et al., (2011); Tiamiyu et al., (2012) and; Kol et al., (2012) that organic manure, especially PM could increase the height of crops. Population that had significant effect on plant height of Okra intercrop with Egusi melon responded to different populations, the observed reduction in okra height under intercropping could have been caused by the intense overcrowding effect of the intercrops when evaluated with sole cropping for available nutrients. This finding agrees with Madu and Nwosu (2001), who reported that yam planted sole, had superior efficiency in utilizing growth environment. Number of leaves of okra plant being significant as a result of the applied PM stressed its importance during the vegetative growth of crop plants (Tindall, 1992). The differences in number of leaves with sole crop being higher than intercropping agrees with Silwana and Lucas (2002) who reported that intercropping reduced vegetative growth of component crops. Okra leaf area index despite the increasing rate of PM was similar except at 12 weeks confirms the report of Ojeniyi (2000) that fertilizer treatment does not give a significant variation on leaf area per plant on any crop. The difference in okra leaf area index at different populations with sole crop being evident was observed. The differences observed due to the applied PM in the yield and yield components were in conformity with the findings of Premsekhar and Rajashree (2009) that higher yield response of crops due to organic manure application could be attributed to improved physical and biological properties of the soil, resulting in better supply of nutrients. Impact of 10 t/ha PM being evident than 5 t/ha in Yield/plant, Number of pods/plant, Number of days to first Flowering, Number of days to 50% flowering, Number of days to first pod harvest and Number of harvest times corroborate with the findings of Ogundiran (2013) and Sanni et al. (2015) that yield increase with an increase in PM rate suggesting that PM supplies nutrients which enhance vigorous growth which are important indices that culminate in increase in fruit yield. The observed differences in all the fruit and fruiting attributes of okra due to different population agrees with the findings of Baloch et al. (2002) that plants with sufficient space will compete for little or no environmental factors.

5 CONCLUSION

Intercropping Okra with ‘Egusi melon enhanced an effective harmonizing biological approach for suppressing of weeds, and total crop yields. Application of 10 t/ha PM was adequate for ‘Egusi melon-Okra intercrop and Okra population of 55,555 plants per hectare gave the optimum economic yield in an ‘Egusi’-melon-Okra intercrop and can be adopted by farmers.

REFERENCES


20(3): 213-216
ABSTRACT

This research focused on the effect of personal selling strategies on customer retention, using Access Bank Plc Ilaro as a study. The objectives of the study were to ascertain the direct relationship between persuasion, information supply or communication and the extent to which trust build customer retention. The essence of this study was necessitated on the backdrop of high customer attrition in banking industry and to create avenues to curb it, as it is less expensive to retain existing customers than to acquire new ones. The researchers employed descriptive research design, the population comprised of all retail banking staff and customers of Access Bank plc, Ilaro Ogun State. Data were collected from primary and secondary sources. Stratified probability sampling techniques was used to arrive at a sample size of 60. Data were analyzed using tables and frequency chats while hypotheses were tested using X² - Chi-square with the aid of SPSS statistical tool. The study found out that customer retention in banks is affected by the level of persuasion, information supply and trust displayed by the sales staff. Therefore, the study recommended that banks should put in place a customer centric team to monitor and address issues contributing to customer defection rate and to develop loyalty reward programs for existing customers to make them loyal for life.

Key Words: Personal selling, Persuasion, Trust, Communication, Customer Retention, Banking services.

1. INTRODUCTION

The hallmark of every business is to identify, anticipate and satisfy customer’s need; maximize profit, possess competitive advantage and remain relevant in the market place. This could be achieved through the adoption of personal selling strategies in a firm’s operations (Anyadigbe, Awara & Esu, 2013). Personal selling plays a vital role of creating direct contact and/or interactions between customers and sellers/producers as well as enhances a firm’s productivity. Productivity is the act of enhancing customer relationship, customer retention and increase sales volume of a firm. Personal selling is a process of assisting and persuading a prospective buyer to buy product in face-to-face situation (Charles, 2011). It involves direct and Personal contact between sellers and his representative with the prospective buyer (Berkowitz, Kerin & Redelius 2000).

Personal selling enhances quick customer response but is quit time consuming and most expensive of all the promotional mix elements (Gupta & Khanta 2003). The need for the adoption of personal selling in the operations/activities of the banking industry cannot be underestimated. Personal selling remains a vital method to contact the prospective buyer personally and to persuade them to purchase a firm’s offerings. Banks can equally use personal selling to convince customers about the quality of their services and the benefit thereof. Personal selling equally assists banks to increase their sales and expand market by identifying new customer, retaining old customers and persuading them to the firm’s product (Joseph, 2000).

Customer retention remains the key factor in giving a firm a competitive edge. In an industry that is characterized by intensive competition; Nigeria Banks are struggling to keep their customers. The research work x-rays how Banks in Nigeria use personal selling strategies in retaining their customers. Banks are trying to reduce costly customer defections through applying relational strategies aiming at continuing patronage with their customers due to the positive effects that can result from customer retention. Customer retention happens when customers are satisfied. This could be as a result of effective personal selling strategies. Customer retention is the ability of a firm to keep/hold customer to continuously patronize its products/services. Personal selling encourages after sales service, this in turn results to customer retention.

However, industry expert claims banks struggle with recovering acquisition cost as it is, and a high customer defection rate makes that recovery more tasking. The major problem in the Nigeria banking industry is that banks are still lacking in so many spheres. Competition has greatly increased in most product/services area and demand for quality, value and services by customers have risen sharply. Also technical skill have inhibited
persuasive capabilities, Relative or shallow information supply in some bank products and lack of trust resulting from fear of the unknown by the customers. Trust is a central concept in building customer relationship; people will never enter into relationship with a bank that is perceived as lacking trust. In response to these trends, effective personal selling strategies seem to offer solution to the issues raised. This study will be of great benefit to the management of the company (Access Bank Plc.) and the marketers as it will indicate the effect of using personal selling as a promotional tools. The researchers would endeavor to ascertain the direct relationship between persuasion, information supply and trust on customer retention as the study objectives. Recently, the bank acquired Diamond Bank making their retail outlet more robust. The branch in Ilaro is located on the ever busy Ibese-Owode road in Yewa South Local Government Area of Ogun State having the Federal Polytechnic, Ilaro as its major landmark.

2. LITERATURE REVIEW

2.1 Personal Selling

Personal selling is a unique element of marketing communication. Unlike advertising and sales promotion which main focus are to create awareness about the existence of a product or services and provide information as to the features of the products, its availability and price on a mass basis, personal selling is an individualistic approach that is designed to meet specific need of prospects. It is usually directed to specific market segments. It goes beyond the fundamental role of marketing communication, it plays significant role in the entire exchange process. That is, participating in the activity of each of the other elements of marketing mix, especially distribution (Anyadigbe et al 2013). Persuasion is a symbolic process in which communicator’s try to convince other people to change their attitudes or behavior regarding an issue through the transmission of a message, in an atmosphere of free choice. (Richard Perloff 2010).

According to the New Zealand Qualifications Authority, (2008) personal selling performs several activities which include; identification of customers, development of product knowledge, marketing, promotion, prospecting, knowledge of customers, service standards, gaining appointments, choosing sales approaches, meeting customers, identifying customer needs and requirements demonstrating products, use of selling techniques, use of sales aids, making sales pitches, overcoming objections, closing sales, completing documentation, receiving payments, recording sales, using sales technologies, providing after-sales services following up sales, and sales analysis. However, essential element of personal selling according to Palmer, (2005) include; face-to-face interaction persuasion, flexibility, promotion of sales, supply of information, trust and mutual benefit.

Customer retention remains the key factor in giving a firm a competitive edge. Banks must identify factors they can enhance customer retention. Kibera and Waruingi, (1998) posit that most organization have in the face of these challenges adopted various strategies to remain relevant and more so in meeting the customer requirements. Increased expectation has necessitated strategic changes in the way organization run their business and relate to their customers that is the overall internal and external environment (Siboe, 2006).

Banks in Nigeria have continued to grow in terms of asset, deposits, profits and product offerings. This has been due to an industry-wide branch network expansion strategy, the automation of a large number of services, and an emphasis on the complex customer needs. This has led to increased competition resulting from increased innovations among the players and new entrants into the market (price water coopers report, 2008).

Pelsmacker and Frow (2005) acknowledges the importance of establishing customer loyalty in view of getting new customers. In the wake of the changing dynamics in the banking sector, Kenyon commercial banks have an uphill task of retaining key value customers, acquiring new customers, building their confidence and maintaining a robust financial performance. Corporate customers who initially would shy away from switching banks are willing to do so if banks ignore the need to hone their service quality (Lam & Burton, 2006).

Kotler & Armstrong, (2008) posits that personal selling is the personal communication between a firm’s sales force and customers for the purpose of making sales and building customer relationship.

(Warren, 2000), personal selling could also be seen as the sequence of stages through which sales persons proceed in making a sale.

Personal selling is a presentation by the firm’s sales force for the purpose of matching, sales and building customer relationship (Kotler and Armstrong, 2010).
Personal selling is also known as face-to-face selling in which one person who is the salesman tries to convince the customer in buying a product. It is a promotional method by which the salesperson uses his or her skills and abilities in an attempt to make a sale.

The salesperson tries to highlight various features of the product to convince the customer that it will only add value. However, getting a customer to buy a product is not the motive behind personal selling every time. Often companies try to follow this approach with customers to make them aware of a new product. The company wants to spread awareness about the product for which it adopts a person-to-person approach. This is because selling involves personal touch, a salesperson knows better how to pitch a product to the potential customer. According to Kotler (2010), “Personal selling is a broader concept and involved oral presentation in a conversation with one or more prospective purchasers for the purpose of making sales.

2.2 Customer Retention

Customer retention refers to the activities and actions companies and organizations take to reduce the number of customer defections. The goal of customer retention programs is to help companies return as many customers as possible, often through customer loyalty initiatives. It is important to remember that customer retention begins with the first contact a customer has with a company and continues throughout the entire life-time of the relationship.

While most companies traditionally spend more money on customer acquisition because they view it as a quick and effective way of increasing revenue, customer retention often is faster and, on average, costs up to seven times less than customer acquisition. Selling to customers with whom you already have a relationship is often a more effective way of growing revenue because companies don’t need to attract educate and convert new ones.

Companies that shift their focus to customer retention often find it to be a more efficient process because they are marketing to customers who already have expressed interest in the products and are engaged with the brand, making it easier to capitalize on their experiences with the company. In fact, retention is a more sustainable business model that is a key to sustainable growth.

2.3 The Conceptual Model

\[ Y = f(x_1, x_2, x_3, \ldots) \]

Where Y = Consumer Retention

X = Personal Selling Strategies

\[ X_1 = \text{Persuasion}, \quad X_2 = \text{Information Supply} \quad \text{and} \quad X_3 = \text{Trust} \]

Developed by the Researchers (2019)
Related Theories

The AIDAS Theory of Selling
This theory, popularly known as AIDAS theory (attention, interest, desire, action and satisfaction), is based on experimental knowledge. This theory is very common. According to this theory by St. Elmo Lewis, potential buyer’s mind passes through the following stages.

With a well-known acronym in the field of selling AIDAS means drawing Attention of Consumers, which is a crucial step in the AIDAS process. The objective is to put the prospect into the right state of mind to continue the sales talk. The salesperson has to convince the prospect for participating in the face-to-face interview; a good beginning of conversation may set the stage for a full sales presentation. The salesperson must apply his social and psychological skills to draw the attention of the prospect to his sales presentation. This is followed by Interest, the second step is to intensify the prospect’s attention so that it involves into strong interest. To achieve this, the sales person has to be enthusiastic about his product. Throughout the interest phase, the hope is to search out the selling appeal that is most likely to be effective. The third step is Desire Stimulating, at this stage, the prospect must be kindled to develop a strong desire for the product. This is a ready-to-buy point. Objection from the prospect will have to be carefully handled at this stage. Time is saved and the chances of making a sale improved if objections are anticipated and answered before the prospect raises them. The fourth step is all about Action Inducing: If the presentation has been perfect, the prospect is ready to act, that is, to buy, very often there may be some hesitation on the part of the prospect at this stage. Once the buyer has asked the seller to pack the product, then it is the responsibility of the seller to pack the product, and reassure the customer that the decision was correct. Finally, Satisfaction: The customer should be left with the impression that the salesperson merely helped in deciding. After the sales have been made, the salesperson should ensure that the customer is satisfied with the product.

The major emphasis of the theory is that a particular circumstance prevailing in a given selling situation will cause the prospect to respond in a predictable way. The set of circumstances can be both internal and external to the prospect. This is essentially a seller-oriented theory and it stresses that the salesman must control the situation in such a way as to produce a sale ultimately.

Theory of Customer Retention
Rockbride has developed theory to measure two constructs that together more fully explain customer retention these are satisfaction and mobility. Existing customer satisfaction surveys often contain enough information to develop both of these measures. The satisfaction and mobility theory have a great deal of independence, meaning that a person who is “highly satisfied” can be either “highly mobile” (i.e., willing to switch to a competitor) or “static” (i.e., unlikely to change brands).

Mobility

<table>
<thead>
<tr>
<th>SAFE</th>
<th>HAPPY BUT MOBILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNHAPPY BUT STATIC</td>
<td>HIGH RISK</td>
</tr>
</tbody>
</table>

Customers can be classified by where they fall on each of the two characteristics;

Safe: Customers are considered as such because they are not only satisfied, but tend not to change services even when their satisfaction level drops. On the other hand, High Risk Customers are both unhappy and more likely than other customers to move on; management might consider writing off this segment, since even if they could be satisfied, they would still be prone to leaving. Attention needs to be focused on the “unhappy but static” customers. Every company has customers like these whether it is due to laziness or fear of inertia; they are likely to remain customers despite their lower satisfaction. Even though their odds of leaving are less, they may still change brands, and a satisfied relationship will move them into the “safe zone”. Conclusively, Happy but mobile customers are satisfied, but are in danger of switching brands, perhaps because they like to shop for new deals or are receptive to marketing pressure. The strategy for retaining these types of customers is a kin to
“watching the chickens in the hen house”. The need to be monitored more closely for switching cues. Companies should also structure pricing and programs to make sticking around economically rewarding. Customer retention depends on much more than a process of continually improving satisfaction. It also requires dealing with attrition as an environmental circumstance that occurs even when the best service is in place.

**Empirical Works**

According to Beatty, (2010) empathy can have beneficial influence on the personal selling in service quality, sales performance and successful selling. A service skill may have an influential impact on customer emotions and further lead to customer loyalty. If customers perceive a salesperson acts trustworthy they are likely to think the behavior is praiseworthy, thus creating positive relationship and brand performance. Personal selling will affect the way they feel about the salesperson. When interacting with a salesperson possessing good expertise, customers are likely to feel fulfilled, pleased and comfortable. Friendliness is also important as it is crucial in increasing satisfaction. The amount of salespeople’s increase personal selling and thus positively related to buyer satisfaction. By this is meant the way salesperson is animated motivated and excited.

According to Etzel and Kaffer (2012) personal selling is a direct communication between a sales representative and one or more prospective buyers in attempt to influence each other in purchasing situation. According to Futrell (2011) personal selling refers to the personal communication where one unselfishly persuade a prospective. Customer to buy something a good or a service, an idea, or something else that satisfy the individual.

According to Peter & Donnelly (2012) personal selling is the most effective tool at certain stage of the buying process, particularly in building up buyers preference, convictions, and actions. It involves personal interaction between two or more people, so each person can observe the other needs and characteristics and make quick adjustments.

3. **METHODOLOGY**

The researchers employed descriptive research design, the population comprised of all retail banking staff and customers of Access Bank plc, Ilaro Ogun State. Data were collected through experiments, observations, the use of questionnaires and other secondary data sources. For the purpose of this research study, sample of 60 (comprising of 10 retail banking staff and 50 retail banking customers of the bank) was be selected; the researchers made use of stratified probability sampling technique to arrive at the sample size. This is due to the fact that our population is huge covering all the entire customers of the bank in Ilaro. The questionnaires were pre tested to ascertain its validity and it conformed to reliability standard. Data were analyzed using tables and frequency chats while hypotheses were tested using X² - Chi-square with the aid of SPSS statistical tool.

4. **RESULTS AND DISCUSSIONS**

**TABLE 1 Analysis of Respondent’s Age**

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below18-24years</td>
<td>10</td>
<td>16.7</td>
<td>16.7</td>
<td>16.7</td>
</tr>
<tr>
<td>25-35years</td>
<td>20</td>
<td>33.3</td>
<td>33.3</td>
<td>50</td>
</tr>
<tr>
<td>36-45years</td>
<td>16</td>
<td>26.7</td>
<td>26.7</td>
<td>76.7</td>
</tr>
<tr>
<td>46 above</td>
<td>14</td>
<td>23.3</td>
<td>23.3</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: field survey March, 2019

The table above shows respondents below 18-24 years with 16.7%, while respondent between 25-35years gather 33.3%, respondents between 36-45year with 26.7% and respondent from 46 above gather 23.3% respectively.

**TABLE 2 Analysis of Respondents’ Educational Qualification**

<table>
<thead>
<tr>
<th>Qualification</th>
<th>frequency</th>
<th>Percent</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSCE</td>
<td>10</td>
<td>16.7</td>
<td>16.7</td>
<td>16.7</td>
</tr>
<tr>
<td>ND/NCE</td>
<td>15</td>
<td>25</td>
<td>25</td>
<td>41.7</td>
</tr>
<tr>
<td>BSC/HND</td>
<td>18</td>
<td>30</td>
<td>30</td>
<td>71.7</td>
</tr>
<tr>
<td>PGD/MSC/MBA</td>
<td>17</td>
<td>28.3</td>
<td>28.3</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: field survey March, 2019
The table above shows that 16.7% of the respondent had SSCE, 25% had ND/NCE, 30% had BSC/HND while 28.3% had PGD/MSC/MBA.

**TABLE 3 Analysis of Respondents’ Gender**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>35</td>
<td>58.3</td>
<td>58.3</td>
<td>58.3</td>
</tr>
<tr>
<td>Female</td>
<td>25</td>
<td>41.7</td>
<td>41.7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: field survey March, 2019

The table above shows that 58.3% of the respondents are male while 41.7% are female.

**TABLE 4 The level of persuasion by salespeople affect customer retention rate?**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>19</td>
<td>31.7</td>
<td>31.7</td>
<td>31.7</td>
</tr>
<tr>
<td>Agree</td>
<td>17</td>
<td>28.3</td>
<td>28.3</td>
<td>60</td>
</tr>
<tr>
<td>Undecided</td>
<td>10</td>
<td>16.7</td>
<td>16.7</td>
<td>76.7</td>
</tr>
<tr>
<td>Disagree</td>
<td>10</td>
<td>16.7</td>
<td>16.7</td>
<td>93.4</td>
</tr>
<tr>
<td>Undecided</td>
<td>4</td>
<td>6.6</td>
<td>6.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: field survey March, 2019

The table above shows that 31.7% of the respondents strongly agree, while others gather 28.3%, 16.7%, 16.7% and 6.6% respectively.

**TABLE 5 The level of information supply by the sales people affect customer retention rate?**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>15</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Agree</td>
<td>18</td>
<td>30</td>
<td>30</td>
<td>55</td>
</tr>
<tr>
<td>Undecided</td>
<td>10</td>
<td>16.7</td>
<td>16.7</td>
<td>71.7</td>
</tr>
<tr>
<td>Disagree</td>
<td>10</td>
<td>16.7</td>
<td>16.7</td>
<td>88.4</td>
</tr>
<tr>
<td>Undecided</td>
<td>7</td>
<td>11.6</td>
<td>11.6</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: field survey March, 2019
The table above shows that 25% of the respondents strongly agree, while others gather 30%, 16.7%, 16.7% and 11.6% respectively.

**TABLE 6** Trust builds customer retention?

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>16</td>
<td>26.7</td>
<td>26.7</td>
<td>26.7</td>
</tr>
<tr>
<td>Agree</td>
<td>14</td>
<td>23.3</td>
<td>23.3</td>
<td>50</td>
</tr>
<tr>
<td>Undecided</td>
<td>5</td>
<td>8.3</td>
<td>8.3</td>
<td>58.3</td>
</tr>
<tr>
<td>Disagree</td>
<td>15</td>
<td>25</td>
<td>25</td>
<td>83.3</td>
</tr>
<tr>
<td>Undecided</td>
<td>10</td>
<td>16.6</td>
<td>16.7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>


The table above shows that 26.7% of the respondent strongly agree, while others gather 23.3%, 8.3%, 25%, 16.6% respectively.

**TABLE 7** If you have been banking with Access bank for more than two year what has motivate you to stay?

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persuasion</td>
<td>14</td>
<td>23.3</td>
<td>23.3</td>
<td>23.3</td>
</tr>
<tr>
<td>Trust</td>
<td>30</td>
<td>50</td>
<td>50</td>
<td>73.3</td>
</tr>
<tr>
<td>Information supply</td>
<td>16</td>
<td>26.7</td>
<td>26.7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: field survey March 2019

The table above shows that 23.3% of the respondents are motivated to stay as a result of persuasion, 50% as a result of trust and 26.7 as a result of the level of information supply.

**Test of Hypotheses**

1. **H₀**: There is no positive relationship between persuasion and customer retention satisfaction
   **H₁**: There is a positive relationship between persuasion and customer retention satisfaction

**Table 8**: Persuasion as a variable of personal selling affects the level of consumer retention

<table>
<thead>
<tr>
<th></th>
<th>Observed N</th>
<th>Expected N</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agreed</td>
<td>32</td>
<td>12.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Agreed</td>
<td>28</td>
<td>12.0</td>
<td>16.0</td>
</tr>
<tr>
<td>Undecided</td>
<td>16</td>
<td>12.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Disagreed</td>
<td>16</td>
<td>12.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Strongly disagreed</td>
<td>6</td>
<td>12.0</td>
<td>-6.0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Test Statistics

<table>
<thead>
<tr>
<th></th>
<th>Persuasion as a variable of personal selling affects the level of customers’ retention.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>12.000*</td>
</tr>
<tr>
<td>Df</td>
<td>4</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
</tr>
</tbody>
</table>

From the test statistics the chi-square 12.000* and the p-value is 0.000, the test fail to accept $H_0$ of insignificant therefore, we accept alternative hypothesis and conclude that there is significant effect of persuasion on customer retention.

2. $H_0$: There is no positive effect between information supply and customer retention  
$H_1$: There is a positive effect between information supply and customer retention.

Table 9: The information supply of personal selling increases customer retention rate.

<table>
<thead>
<tr>
<th></th>
<th>Observed N</th>
<th>Expected N</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agreed</td>
<td>16</td>
<td>12.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Agreed</td>
<td>24</td>
<td>12.0</td>
<td>120</td>
</tr>
<tr>
<td>Undecided</td>
<td>5</td>
<td>12.0</td>
<td>-7.0</td>
</tr>
<tr>
<td>Disagreed</td>
<td>5</td>
<td>12.0</td>
<td>-7.0</td>
</tr>
<tr>
<td>Strongly disagreed</td>
<td>10</td>
<td>12.0</td>
<td>-2.0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Test Statistics

<table>
<thead>
<tr>
<th></th>
<th>The information supply of personal selling increases customer retention rate.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>21.826*</td>
</tr>
<tr>
<td>Df</td>
<td>4</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
</tr>
</tbody>
</table>

From the test statistics the chi-square 21.826* and the p-value is 0.000, the test fail to accept $H_0$ of insignificant therefore, we accept alternative hypothesis and conclude that there is significant effect of information supply on customer retention.

3. $H_0$: There is no significant effect between trust and customer retention  
$H_1$: There is a significant effect between trust and customer retention
Table 10: Trust as a variable of personal selling does not have any effect on Customer retention

<table>
<thead>
<tr>
<th></th>
<th>Observed N</th>
<th>Expected N</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agreed</td>
<td>23</td>
<td>12.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Agreed</td>
<td>18</td>
<td>12.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Undecided</td>
<td>5</td>
<td>12.0</td>
<td>-7.0</td>
</tr>
<tr>
<td>Disagreed</td>
<td>7</td>
<td>12.0</td>
<td>-5.0</td>
</tr>
<tr>
<td>Strongly disagreed</td>
<td>7</td>
<td>12.0</td>
<td>-5.0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Test Statistics

<table>
<thead>
<tr>
<th></th>
<th>Trust as a variable of a personal selling does not have any effect on customers’ retention.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>26.37²</td>
</tr>
<tr>
<td>Df</td>
<td>4</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
</tr>
</tbody>
</table>

From the test statistics the chi-square $26.37^2$ and the p-value is 0.000, the test fail to accept $H_0$ of insignificant therefore, we accept alternative hypothesis and conclude that there is significant effect of trust on customer retention.

4.2 Discussion of Result

In carrying out this research project, the researchers observed certain fact from Access Bank Plc. i.e. the organization used for the study. Analysis shows that those variables such as persuasion, information supply and trust have positive effect on customer retention in the sense that it motivate customers and make them feel safe. This result also shows that personal selling is very much indispensable to the growth of the organization as it assists banks in achieving its set goals and objectives. It was also discovered that the problem of personal selling can cause customer attrition or switching if not properly handled. The result also shows that customer will not patronize banks that they did not trust therefore banks should improve on their personal selling strategies in other to build trust and make customer to become loyal to their bank.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Going through the present investigation on the effect of personal selling strategies on customer retention, many findings and result were made in service and finance-oriented organization.

The result postulated that customer retention in banks is affected by the level of persuasion, information supply and trust. All these variables are proposed to have a great deal of impact on customer retention.

5.2 Recommendations

Based on the conclusion on the effect of personal selling strategies on customer retention as obtained from this study, the following recommendations will be useful to the concerned stakeholders.

- Banks should put in place a customer retention team to monitor and address issues contributing to
customer switching and retention.

- Banks should come up with a loyalty reward program for existing customers to retain them in their banks.
- Banks should come up with ways of rewarding the sales force for retaining customers.
- Bank management should take a major review of the procedures and policies of their banking activities so as to make them more customer responsive as this will make the customers satisfied and hence the bank will be able to retain them.
- Banks should also conduct lost customer analysis to find out customers who have switched to other banks to learn why this happened.
- Banks should work to achieve and build on corporate images through provision of quality services innovates and competitive pricing.

REFERENCES


Peter, J. & Donnely.A. (2012).*Marketing Management: knowledge and Skills..*Boston,irwin/Mcgraw-hill


WOMEN EMPOWERMENT THROUGH ENTREPRENEURSHIP DEVELOPMENT: A VEHICLE FOR ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

This study looks at women empowerment through Entrepreneurship Development as a vehicle for Economic growth in Nigeria. This study was purely an extensive review on past related literature. In this case, the data for this paper were retrieved from secondary sources in terms of books, journal articles related to the subject. The findings revealed that women empowerment through entrepreneurship development is truly a vehicle for economic growth of a nation based on its importance of entrepreneurship to individual, societies, benefits, impact to women empowerment and the role of Entrepreneurship in the Economic Development of a nation, in terms of creation of job opportunities, wealth creation and distribution, improvement of the standard of living etc. which consequently leads to economic growth. The study recommended among others that: women should be educated on the importance and benefits of entrepreneurship which could be achieved through organizing seminars for women. They should be an awareness campaign on the need for women to acquire skills. Special training course should be offered for women entrepreneurs to learn a skill. The government should make efforts in providing entrepreneurship development programmes targeted at assisting the women to access funds. The government should beefed up security both in urban and rural communities and tackle the issue of corruption. The government should address the problem of power supply because it is the major factor in the economy in terms of entrepreneurial activities. Interest free consumption credit for women should be provided by the government, banks, financial institution.

Keywords: Women Empowerment, Entrepreneurship Development and Economic growth

1 INTRODUCTION

One of the critical factors in deciding the success of development in any country is the status and position of women in the society. This goes to show that the disuse of women in the development process of any country constitutes a human resource waste. It means, it will be disservice for any country to ignore its women population in its development efforts. The task before any government should be that of moving steadily and firmly in the direction of economic development by involving women. Faleye (1999) as cited in Money and Edjore (2016) stated that women’s development is not about reducing poverty but increasing productivity, as well as women’s liberation and empowerment.

Wikipedia (2019), posited that over the years, a high level of entrepreneurship is what has led to the economic development of many nations we see today. Even the United Nations University World Institute for Development and Economics Research carried out a project on the role of entrepreneurship in economic development. Their work was compiled into a book titled Entrepreneurship and Economic Development to really showcase the importance of entrepreneurship in economic development.

China is a good example of a nation with an impressive economic development that came about as a result of the promotion of entrepreneurship among its citizens. Well developed countries are more interested in entrepreneurs than people in white collar jobs. In the economy today, education is being redefined to produce entrepreneurs and not just job seekers. No wonder today, we have Entrepreneurships Development Centre in most Institutions of Higher Learning and Federal Polytechnic, Ilaro inclusive. So, the role of entrepreneurship in the economic development of Nigeria cannot be underestimated especially in times like this.

Ajayi, et al (2010:1&2) posit that, whenever one is thinking of establishing and managing of small business, one is thinking of entrepreneurship. Entrepreneurship is very interesting because many people want to establish small businesses but certain questions are in their minds which are yet to be satisfied or given good answers to. Because of these questions, some are out there still in paid employment and some are not in any employment...
but cannot take the bold entrepreneurial step because of the fear of failure which results from lack of entrepreneurship knowledge.

The questions which usually counter the thought of establishing a business are: How do I start the business? How do I run the business? And how do I run the business successfully or profitably? Where answers are not provided for these questions, it would be very difficult to actualize one’s desire to business establishment. It should be noted that many people want to establish a business in life but lack of knowledge of at least the idea of entrepreneurship prevents most people from realizing their business dreams or visions.

As a result of the above, the main objectives of the study was to educate and expose the women on the strategies of starting a business, the importance of entrepreneurship to individual, societies, as well as the benefits, impact to women empowerment and the role of Entrepreneurship in the Economic Development of a nation, in terms of creation of job opportunities, wealth creation and distribution, improvement of the standard of living etc. which consequently leads to economic growth of a nation.

The significance of the study was to exposed those key areas where Entrepreneurship can lead to women empowerment and Economic growth as well as leading to development of a nation like Nigeria. The study may be of benefits to women as they engage in Entrepreneurship Development as well as the government in the area of economy, planning, education, researchers, policy makers and academicians of the concern areas.

2. LITERATURE REVIEW

Concept of Entrepreneurship

Different authors have given different definitions to this word but entrepreneurship is simply defined as the establishment and management of small business. A wide definition of entrepreneurship is the generation of a business idea or identification of a business opportunity and putting in place of a business to take advantage of the idea or opportunity within an economy.

There has been difficulty in reaching a consensus about an exact definition of entrepreneurship and it has been argued that the term ‘entrepreneurship’ in itself has three levels of meaning. In the first level, entrepreneurship refers to small firms or enterprises, in the second level it refers to new firm formation and at the third level highest entails innovation and a system-wide coordination of complex production. Entrepreneurship embraces small business, innovation and regional and local development policy.

The business dictionary (2013) as cited in Adeniyi (2017:149) defines entrepreneurship as the capacity and willingness to develop, organize and manage a business venture along with any of its risk in order to make profit.

Odusina in Osuala (2004) as cited in Adebola (2017:2), defined entrepreneurship as a process of using available capital in any form for business endeavours in an open and free market economy for the sole purpose of making a profit. Nwaokolo in Osuala as cited in Adebola (2017) also defined entrepreneurship as the ability to set up a business enterprise as different from being employed. This ability should be acquired and should differ in some respects from the abilities required to enable a person get employed; it involves the acquisition of skills, ideas and managerial abilities necessary for self reliance. The entrepreneur is a person who owns and controls a business through which income is gained. The sole idea of entrepreneurship is achieved when the entrepreneur takes risk which is energized by inner drive and the ability to develop a new venture and apply a new approach to old business.

Women's empowerment

Empowerment is one of the key concepts of this study. Ajay S. et al (2012), the word empowerment means giving power. According to the International Encyclopedia women empowerment means having the capacity and the means to direct one's life towards desired social, political and economic goals or status. Empowerment is a process by which women gain greater control over resources (income, knowledge, information, technology, skill and training), challenge the ideology of patriarchy and participate in leadership, decision making process; enhance the self-image of women, to become active participants in the process of change and to develop the skills to assert themselves. Entrepreneurship may be a force that mobilizes other resources to meet unmet market demand, the ability to create and build something from practically nothing, it is a process of creating value by pulling together a unique package of resources to exploit an opportunity.
Empowerment is the process in which women deliberate and recreate what it is that they can be, do, and accomplish in a circumstance that they previously were denied. Empowerment can be defined in many ways, however, when talking about women's empowerment, empowerment means accepting and allowing people (women) who are on the outside of the decision-making process into it. “This puts a strong emphasis on participation in political structures and formal decision-making and, in the economic sphere, on the ability to obtain an income that enables participation in economic decision-making.” Empowerment is the process that creates power in individuals over their own lives, society, and in their communities. People are empowered when they are able to access the opportunities available to them without limitations and restrictions such as in education, profession and lifestyle. Feeling entitled to make your own decisions creates a sense of empowerment. Empowerment includes the action of raising the status of women through education, raising awareness, literacy, and training. Women's empowerment is all about equipping and allowing women to make life-determining decisions through the different problems in society.

Entrepreneurship Development

UNDP (2010) as cited in Kennedy (2014) defined entrepreneurship development as referring to the process of enhancing entrepreneurial skills and knowledge through structured training and institution building programmes. According to UNDP, entrepreneurship development aims to enlarge the base of entrepreneurs in order to hasten the pace at which new ventures are created. This accelerates employment generation and economic development. Entrepreneurship development focuses on the individual who wishes to start or expand a business. Furthermore, entrepreneurship development concentrates more on growth potential and innovation.

Economic Growth

Economic growth can be defined as an increase in the real value of goods and services produced in the economy from one year to the next. In other words, the country is aiming to have more goods and services available for sale every year (http://economics.mrwood.com.au/student.asp). Other scholars view economic growth as “a positive change in the level of production of goods and services by a country over a certain period of time”. It refers only to the quantity of goods and services produced. It is often measured as the rate of change in GDP (Wikipedia, 2010) as cited in Kpelai (2013)

The Relationship between Entrepreneurship and Economic Growth

Asc (2006), Ahiauzu (2010) and Henderson (2007) as cited in Adeoye (2015) posited that there is a positive relationship between entrepreneurship and economic growth while Henderson explained that entrepreneurship is increasingly being recognized as a primary engine of economic growth. By combining existing resources with innovative ideas, entrepreneurs add value through the commercialization of new products, the creation of new jobs, and the building of new firms. The Global Economic Monitor indicates that nations with higher levels of entrepreneurial activity enjoy strong economic growth. Findings from Zwingina (2017) are evidence that, entrepreneurship development is positively related to women economic empowerment in term of wealth creation and standard of living with statistical significance. This implies that, women wealth creation and standard of living improve as women entrepreneurship development programmes increase. This finding is consistent with the findings in previous studies such as Asc (2006); Ahiauzu (2010), and Kpelai (2013) as cited in Zwingina (2017) The study tallies with the theory of Economy. The theorists here saw an entrepreneur as an agent of economic change. They argued that changes either in the environment or organization are a transformation that can occur as a result of the reaction of some economic forces. Economists assume that entrepreneurs behave rationally towards some economic forces (business opportunities, resources etc.) that result to change in environment in form of enterprise. Entrepreneurship was seen as a process or positive event to every economic revolution.
Strategies to Starting a Business

- Do a Research
- Have a Plan
- Identify a business plan
- Decide on Finance required
- Choose a Business Structure
- Register the Business

Fig. 1 Process of starting a Business

Do a Research: After identifying a business idea, it is necessary to balance it with a little research. Find out whether there is a need for the goods or services you have in mind. Make a research of your potential market. Ask pertinent questions such as: Is there a need for the anticipated goods/services? Who are the potentials e.g. children, adults, women, students, etc? Are there companies offering similar products/services now? What is the competition like? And how will the potential business fit into the market? These and many more are some of the research questions that require empirical answer.

Make a Plan: A plan is needed in order to make a business idea a reality. A business plan is a blueprint that will guide the business from the start-up phase through establishment and eventually business growth, and it is a must-have for all new businesses.

Identify a Business Location: Setting a place or location of business is important for its operation. Decide whether to have a home office, a shared or private office space, or a retail location. You will need to think about your location, equipment and overall setup and make sure the location works for the type of business you will be doing.

Decide Your Finances Required: Starting a small business doesn’t have to require a lot of money, but it will involve some initial investment as well as the ability to cover ongoing expenses before turning in profit. Put together a spreadsheet that estimates the one-time startup costs for the business as well as what to anticipate and will keep the business running for at least 12 months.

Choose a Business Structure: A small business can be a sole proprietorship, a partnership, a limited liability company or a corporation. The business entity chosen will impact many factors from the business name, to liability, to how you file taxes. A business structure can first be chosen and then reevaluate and change the structure as the business grows and needs change.

Pick and Register a Business Name: A business name plays a role in almost every aspect of a business. Once a name has been chosen for the business, it will need to be checked if it’s trademarked is currently in use before it can be registered. Wikipedia (2019)
Importance of Entrepreneurship to Individuals

Entrepreneurship is very important to individuals and the societies at large according to Adeyanju et al (2010).

- It is a means of livelihood for individuals by way of employment for the entrepreneur and his employees.
- It keeps individuals busy.
- It helps in improving standard of living.
- Entrepreneurship forms the means by which individuals get their various demands satisfied through the provision of goods and services by businesses.
- It forms a practical training ground for employees.
- It encourages employees to establish businesses thereby allowing talented and creative ones to display their talents and creative abilities to their advantages.
- It helps individuals to get improved goods and services at it create competition among businesses.

Importance of Entrepreneurship to Societies

- It reduces the economic problem of unemployment in a community, state or nation.
- It trains people and aids entrepreneurial development for the good of the community and nation.
- Entrepreneurship helps communicate and nations to reduce socio-economic crime such as robberies associated with unemployment, thereby making the communities and nations enjoy relative peace.
- It helps in the revamping of a nation’s poor economy and to improve the good ones.
- It helps in the utilization of a community or a nation’s resources.
- It helps to reduce rural/urban migration.
- It helps to reduce poverty, thereby increasing the standard of living of the citizens of a nation thereby satisfying the desires of such nation.
- It encourages the patronage of local goods and services and relatively discourage patronage of foreign goods and services.
- Entrepreneurship brings industrialization and economic development to communities and nations.
- It aids a nation’s wealth building.
- It helps to improve efficiency and effectiveness in operations.
- It allows a nation’s resources utilization, while keeping down resources wastage in a nation.
- It helps to support the much needed industrial production of the real sector of an economy.
- It helps a nation to have improved foreign reserves and balance of payments and balance of trades, via increase in Gross Domestic Exports GDP and exportation.

Benefits of Entrepreneurship

The freedom to pursue your own vision: You can have your own view of the world, and entrepreneurship is the only venue where you pursue that view and see the fruition of your vision. Self-employment allows you to do your own thing, and pursue those areas that you feel passionate about.

The control and flexibility you have over your own time: As your own boss, you work when you want to work; and stop if you want to stop. You can tailor your work according to your lifestyle and accommodate various tasks. You can work in however way you please. Self-employment means freedom from rules.

The opportunity to learn and gain knowledge: The entrepreneur often wears many hats, the strategic planner, the marketer, the customer service rep, and the sales rep, even the bookkeeper. There are a million things you probably didn’t know before you started the business that you are now forced to learn and gaining all these knowledge enriches you as a person.

The sense of pride and fulfillment in accomplishing things: As an entrepreneur, you make things happen. You create a vision, lay out the plans to bring the plan to fruition and pursue the steps needed to make the business a success. Doing all these things can give you an incredible feeling of pride and joy – seeing your website used by people.

The confidence you gain in knowing that you can do it: Entrepreneurship is tough. There will be moments where you will question yourself, or your decisions into going into the business. Sometimes, you’d even think that you couldn’t do it when the obstacles seem insurmountable. But once you succeed and overcome the challenges, you gain a renewed confidence and respect for yourself that you can do it.
Potential earnings exceed a salaried employee: As an employee, no matter how hard you work, the financial remuneration you receive is limited to your salary and an occasional bonus. As a self-employed person, you can earn so much more if you hit the right business idea and execute the business well.

Business owner reaps the full rewards: You are the business; anything the business gain is yours. If you are an employee in the corporate world, your bosses may even claim your success as theirs! If you are working for others, you are only a cog in the whole machine. Wikipedia (2019).

Impact of Entrepreneurship Development on Women Empowerment

Self-confidence of Women: Increased self-confidence through entrepreneurship development gave the women a prosperous future.

Economic Solvency: The most important changes come through increase in income, which not only upgrades the individual’s life but also increases her standard of living, bringing economics solvency within the family. The increase in her income is also an increase in the family income and as such it provides family members to a better life style, including education for the children and improvement of family health.

Capital Building: Their (Women) economic success enables women to expand their business, procure new machinery, tools, accessories and relevant necessities. Modernization of the work-place, introduction of new technology for increase production, increase of labourers, along with the increase in purchasing power, upgrades their status both socially and economically.

Role of Status: Some aspects of household decision making are reported to have changed as a result of women’s contribution in family income. Most of the men now consult with their wives in important family matters. Their power of decision making has increased because they have money. Since women retain control over earnings, women can easily lend small and big amounts to business and others without asking for their husbands’ permission. Since women perceive that their bargaining power within the family has increased as an indirect outcome of participating in the business. Women’s status has changed in the family and society gradually. Wikipedia (2019)

Role of Entrepreneurship in the Economic Development of Nigeria

Entrepreneurship in Nigeria has helped the economy of the country over the years in a lot of ways. Let us take a look at some of the most important roles of entrepreneurship in economic development of our country.

Creation of job opportunities: Entrepreneurship creates job opportunities, first for the entrepreneurs. However, entrepreneurs are referred to as job creators as well, because when they start a business for themselves they create jobs for other people. Once more of these businesses hire people, they reduce the unemployment rate in the country.

Development of Small and Medium-sized Enterprises: Entrepreneurship in a country promotes and gives strength to Small and Medium-sized enterprises (SMEs). The level of entrepreneurship development in a nation is determined by the number of Small and Medium-sized enterprises (SMEs). The more SMEs a country has, the more likely it will attain progress.

Increase in Gross Domestic Product (GDP) and Per Capital Income: Gross Domestic Product is known as the total value of all the goods and services that are produced by a country in one year. Per capita income is the average income earned per citizen or resident of a geographical region in one year. Per capita income is calculated by dividing the total income of a geographical area by the population. Entrepreneurs make use of the resources in a country to produce more goods and services and added value. This will, in turn, increase the Gross Domestic Product of the country. Also, SMEs create employment income for people, thereby accounting for an increase in the per capita income of Nigeria as a country. A growth in the Gross Domestic Product (GDP) and a high per capita income are strong indices of economic development of a country.

Wealth creation and distribution: Through the creation of business entities, wealth is mobilized and distributed by entrepreneurs. The public will benefit from the success and wealth of entrepreneurs in Nigeria. As businesses grow and expand, it allows for more investors to come into the market with their ideas to improve the goods and services and make them available at an affordable rate. The more capital and resources are being pooled into generating product and services, the more entrepreneurs, employees, and the public will benefit from it. Wealth
is created for the entrepreneurs and also distributed to the public in the form of employment, goods, and services.

**Improvement of the standard of living:** The standard of living of a country is usually determined by the per capita income of the country. It is the amount of wealth, goods, and services available to people, especially of the lower socioeconomic class. Entrepreneurship through Small and Medium-sized Enterprises will provide more employment income for Nigerians. As explained above, this will increase the average per capita income of Nigeria and as a result improve the standard of living. Also, innovative ideas of entrepreneurs who create wealth, goods and services that improve the lives of the people in the country. *Wikipedia (2019)*

### 3. METHODOLOGY

Considering the objectives of this study, the researcher relies on past related literature to lend credence to assertion as identified in this paper. This is based on universally accepted notion that past authorities views can be relied upon in academic papers and to be acknowledged. In that case, data for this paper were derived from secondary sources in terms of previous researches and analyses of scholars, books, journal articles related to the subject as the study involved in an extensive literature review which analyzed the importance and benefit of entrepreneurship as well as the impact on women empowerment and the role of entrepreneurship in the Economic Development of Nigeria.

### 4. CONCLUSION & RECOMMENDATIONS

#### 4.1 Conclusion

Findings from this study and that of other researchers one can come into a conclusion that Entrepreneurship is truly a vehicle for women empowerment and economic growth of any nation considering the impact of entrepreneurship development on women empowerment and the role of entrepreneurship in the economic development of Nigeria in terms of employment opportunities etc. thereby leading to economic growth of a nation.

#### 4.2 Recommendations

From the above result, the study therefore recommends the following:

- Women should be educated on the importance and benefits of entrepreneurship which could be achieved through organizing seminars for women.

- They should be an awareness campaign on the need for women to acquire skills. Special training course should be offered for women entrepreneurs to learn a skill.

- The government should make efforts in providing entrepreneurship development programmes targeted at assisting the women to access funds.

- The government should beefed up security both in urban and rural communities and tackle the issue of corruption.

- The government should address the problem of power supply because it is the major factor in the economy in terms of entrepreneurial activities.

- Interest free consumption credit for women should be provided by the government, banks, financial institution etc.

### REFERENCES


INFORMATION LITERACY SKILLS, COMPUTER SELF-EFFICACY AND E-RESOURCES USE AMONG FEMALE JOURNALISTS IN OGUN STATE

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ABSTRACT
The provision of electronic resources in Journalism plays a prominent role in facilitating access to required information by the users in an easy and quick manner. Electronics information resources are essential in the information environment. Therefore, this study investigated the influence of information literacy skills and computer self-efficacy and use of e-resources among female journalists in Ogun state. The study adopted the survey research design. The study population comprised of 50 female journalists in five media houses located in Ogun state. Convenience sampling was used in the selection process. The collected copies of questionnaire were analyzed using descriptive analysis and correlation and regression were used for testing the formulated hypotheses. Based on the high frequency of the e-resources as found by the study, the study recommends that owners of media house should ensure a continuous provision of e-resources with adequate information communication technology tools to facilitate their use. The study also recommended that female journalists should continually engage and update their computer skills training in various aspects of information literacy and computer skills as this will ensure a continued and more effective utilization of e-resources among the female journalists for efficiency and capability.

Keywords: Information literacy, Computer self-efficacy, e-resources, ICT, Skills, Journalism

1. BACKGROUND TO THE STUDY

It is believed that the Internet impacts other media, it seems from all intents and purposes that print media are the greatest casualty of the Internet onslaught, one of the difficulties that print media are described as ‘hot’ media with all the suggestions of linearity. Not that broadcast is totally insulated from the internet invasion. Not minding the well founded fears of an endangered print media, it is obvious that the story is different in developing countries particularly Nigeria, where digital knowledge is till at a relatively low stage. The entrance of digital broadcasting brought sound and images that are clearer from the comprehension and appreciation of the audience, information literacy, computer self-efficacy and e-resources use among journalist becomes vital.

Some of the many tools that have changed the face of journalism today and the face of information resource are Laptop and notepad, they are portable computers that allow journalists to leave their offices and still have access to everything they need via internet. Also, smart phones can be used for email texting, internet access, and video camera, film editing, photography, uploads (to share on social media) and more, have made phones handy device for journalists. It is an office in pocket but it has it setback; some courthouse will not allow electronic device and journalist may have difficulties in printing or copying from there unless hook up to a computer and printer but still very good and valuable for computing quick stories and details. Electronic resources could be defined as any materials that are available and can be accessed electronically through computer networked facilities such as online library catalogues, the internet and the World Wide Web, digital libraries and archives; government portals and websites, CD-ROM databases, online information databases, such as Medline or commercial databases such as LexisNexis (Karunarathna, 2014).

The introduction of e-resources has drastically changed communication; journalists are beginning to have a new way of packaging and disseminating news to the public. The world is now smaller for journalists to explore. This wonderful technology has encouraged researches on various subject matters available via chatting and exchange of messages. This has created an avenue for journalists to work as online journalists, content managers or editors for particular websites. This has forced journalists to learn new skills on how to add content to a web site, blog and create hyper text links the coming of the internet is also leading journalists to be more versatile on their profession. Considering the complexity associated with the use of electronic resources, female journalists require information literacy skills to access and use information. The complexity of electronic resources has also led to the tedious search, which further discouraged female journalists in using e-resources. Although most female journalists can be said to own a laptop, iPad or mobile phone which exposes them to the use of technology, the use of such electronic devices do not guarantee knowledge of information literacy skills needed to access web-based resources or electronic databases in media house library. The acquisition of information literacy skills is essential for journalists, especially female journalists in order to evaluate and make ethical use of information

Self-efficacy as a concept was propounde by Bandura (1977) who affirmed that success is not only based on the possession of necessary skills, but also on the confidence to use skills effectively. Self-efficacy is the confidence that one can successfully perform a task. Self-efficacy, therefore, can be termed as an inherent belief that motivates a person to
accomplish given task based on positive self-assessment. The term self-efficacy helps in understanding why individuals decide to focus on particular activities and the degree of effort they exert on such activities. Self-efficacy is the belief that an individual has the confidence and the ability to perform the courses of actions to respond to a given situation in which he need. Individual can also display different level of computer self-efficacy, those with low self-confidence or self-efficacy may likely shy from the use of computers. Even when they do, they may likely see it as a laborious exercise, whereas, even when computer skills are not perfect, the individual with high self-efficacy may be pushed to keep using the computer, believing that he or she is capable of utilizing it, thereby, enhancing personal skills through practice. With this belief also comes the motivation to utilize the computer. Female journalists with high computer self-efficacy are more likely than others to explore new technologies, software or databases. In use of electronic resources, it can, therefore, be assumed that female journalists with high computer self-efficacy would be more likely to take advantage of e-resources when compared to other journalists with low self-efficacy, as the later may lack the confidence or shy away from using computer-based resources.

Statement of the Problem
Because of the new technologies concerning journalism, as the world it is turning global hut because of new way of practicing the profession. As a result of this journalism must sustain the mission to provide the balanced through the provision of information resources in a variety of formats including electronic format. Whit this no doubt, there will be immense access to current information at the right time and in the right place, provides the opportunity to search several files at a time and this also presents a lot of challenges as it is computer-based and requires information literacy for searching, retrieval, and use. Therefore, this study is aimed at how female journalists in Ogun state have information literacy skills and computer self-efficacy on the use of e-resources.

Objective of the study
The specific objectives of this study are to:
1. Ascertain the relationship between information literacy skills and the use e-resources by female journalists in Ogun state.
2. Determine the relationship between computer self-efficacy and the use of e-resources by female journalists in Ogun state.
3. Appraise the combine influence of information literacy skills and computer self-efficacy on use of e-resources by female journalists in Ogun state.

Research Questions
From the objectives, the following research question were generated to provide solution to the pending problem the study intends to look into.
1. What is the level of information literacy skill of female journalists in Ogun state?
2. What is the level of computer self-efficacy of female journalist in Ogun state?
3. How does combined effect of information literacy skill and computer self-efficacy impacted on the use of e-resources among female journalists in Ogun state.

Hypotheses
The study was guided by the following null hypothesis:
H01. There is no significant relationship between information literacy skills and e-resources use among female journalists in Ogun state in South-West, Nigeria.
H02. There is no significant relationship between computer self-efficacy and e-resources use among female journalist in Ogun state.
H03. The combine effect of information literacy skills and computer self-efficacy do not have significant influence on e-resources use among female journalist in Ogun state.

Conceptual Review
The internet has influenced the way news and information are produced and disseminated to the public. Overtime things have indeed changed; people’s lives have been affected on the side of the divide one finds himself. The rapid adoption of internet by journalist is a universal event. The use of computer enhances accuracy and timeliness, hence controlling newspaper and magazine costs. Moreover, the use of computer for electronic editing; proofreading, formatting, etc. and other tools has helped in the speed and ease news gathering and dissemination is done. Bittner, (1989) affirmed that the power of teletex today has helped in the transmission of text from the computer to a television transmission system sending data to various media houses as well as home. This has brought new era in the history of media technology. Electronic editions of newspaper have also been developed to delivered news to our different homes through our android phones and internet

It is observed that the convergence of computer and telecommunication are the material forces in the new technology of mass communication. The internet has revolutionized the process of news and information processing, this explains that the presences of social media are also changing the phase of journalism. CityVarsity (2018)

The role of journalist remains to report the truth and factual information. Journalism has undoubtedly evolved over the years. In modern journalism, report doesn’t necessarily rely on going out into the field to find stories and waiting for a story to be printed, there is a digital world that has emerged. Journalists now use this technology as a tool to enhance their reporting. Journalism today exists in a fast paced and immediate digital world that is rich with pact content. When we look at media houses today, most of them have a digital platform as an alternative or main issuer. They can simply go on to the internet to find out what is taking place around the world. Most media house now can call their online audience, their primary audience when comparing their impact to the print audience.
For journalist in this era, it is vital to stay on top of things, be socially connected and use the content available in the digital space to edify your work. Though, face-to-face interviews, real time experience are still and will always be relevant and timeless. Notwithstanding, the digital platforms and tools have created massive change in how conveniently we receive and sent news. We can therefore, say that the digital age has advanced journalism and created more opportunities for journalists. It is a great outlet to distribute and collect news. CityVarsity,(2018)

E-Resources in journalism
Electronic resources entail sources of information which libraries provide access to in electronic format. There comprise all forms of electronic collections such as online databases; online public access catalogue (OPAC), e-books and e-journals. In the work of electronic reference books, search engines for full-text collections, digital collections of data and data sets. Bipin and Panda (2012) opined that electronic resources is a term that involves several publishing formats, such as wireless publishing, e-books, print-on-demand (POD), electronic link and web publishing, e-mail publishing, E-journals.

2. INFORMATION LITERACY SKILLS OF JOURNALISTS
Amalahu, Oluvasina, and Laoye (2009) said information includes library literacy, computer literacy, research literacy and critical thinking skills. Webber, Johnston, and Baon (2002) observed that definitions of information literacy vary but generally include the following: effective information seeking; informed choice of information sources; information evaluation and selection; comfort in using a range of media to best advantage; awareness of issues to do with bias and reliability of information; and effectiveness in transmitting information to others. It is believed that literacy which sometimes is interchangeably used by some journalists to mean information literacy only refers to the comfort level someone has with using computer programs and other associated application computers. Computer self-efficacy implies the ability of an individual’s believed that one has the ability to perform a particular task with the computer. Computer self-efficacy is an important factor that aids e-resources utilization in the technological world. Journalists may not be able to make maximum use of e-resources which are computer-based if they do not see themselves as being able or having the capability to do so. While on the other hand journalists who are confident in their ability to use the computer-based resources will make maximum use of them. The level of usage of e-resources by journalist will depend on their level of computer self-efficacy. The knowledge of the use computer is one of the basic requirements for effective utilization of e-resources.

Theoretical Framework
The study employed Self-efficacy theory and technological determinism theory. The self-efficacy theory which was propounded by Bandura in 1977. The say that people will succeed in the tasks they believe they have the ability to successfully accomplish. Self-efficacy theory says that people generally will only do things they believe they can accomplish and will not do thing they believe they will not succeed. People with a strong sense of efficacy believe they can accomplish even difficult tasks. They see difficult tasks as challenges to be mastered, rather than threats to be avoided (Bandura, 1994). Individuals are engaged in and responsible for their own development toward goals, and their success is related to their self-beliefs. People with strong self-efficacy approach difficult or threatening situations with confidence that they have control over them. On the other hand, people who doubt their ability to accomplish difficult task see these tasks as threat. They avoid them based on their own personal weakness or on the obstacles preventing them from being successful. People with low self-efficacy give up quickly in face of difficulty or challenging tasks.

The theory clearly states that individual have unique roles in producing behavioral change and has concluded that self-efficacy plays a central role, both directly and via its influences on the other determinants, in predicting change in behavior (Bandura, 2004). This is so, because; individual’s use of a system depends to a large extent on their beliefs or confidence that they are able to accomplish the tasks using the system. Journalists may not be able to make maximum use of e-resources which are computer-based if they do not see themselves as being able or having the capability to do so. While on the other hand journalists who are confident in their ability to use the computer-based resources will make maximum use of them. The level of usage of e-resources by journalist will depend on their level of computer self-efficacy.

Technological Determinism Theory
Technological Determination is the basis (theory) upon which this work is anchored. The theory states that media technologies shape how we as individuals in a society think, feel act and how a society operates as we move from one technology age to another (Tribal-literate –print –electronic). Griffin (2000) elaborate McLuhan’s theory of 1963 that we learn, feel and think the way we do because of the message we receive through the current technology that is available. McLuhan (1962) affirmed radio required us to only listen and develop our sense of warning. On the other hand, television engages both our hearing and visual senses. We then transfer those developed senses into our everyday lives and we want to use them again. The medium is then our message. With the development of technology the profession of journalism after test running the effects of latest medium then explores its potentials to reach the audience. Today internet is the latest through which journalism thrives.

3. RESEARCH DESIGN
A research design is the set of methods and procedures used in collecting and analyzing measures of the variables specified in the research study. It is the framework created to find answers to research questions (Jalil, 2013). The research design adopted for this research work is the survey research design of correlation type. The researcher chose this design because Berger (2000, p. 188) draw attention to four key points about survey research method; it’s used to collect and analyses social, economic, psychological, technical, cultural and other types of data; it is based on interviewing people (i.e respondents) and asking them for information; it is done with representative sample of a population being studied, and it is assumed that information obtained from the sample is valid for the general public. This research design is considered most
appropriate for the study because it gives better understanding of the situation at hand in terms of the extent of relationship existing between the dependent and independent variables being studied. This research design enables a researcher to find out the relationship between the measures of different variables obtained at the same time.

**Population**
The population for this study consists of all female journalists in Ogun State. But female journalists in Abeokuta were purposively selected to represent the female journalists’ population in Ogun state in Nigeria.

**Sample size**
A purposive selection of radio and television stations as well as print media houses located in Abeokuta, Ogun state.

<table>
<thead>
<tr>
<th>S/N</th>
<th>State</th>
<th>Lists of the Media houses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abeokuta</td>
<td>Black Pride Magazine, Idi-Aba, Abeokuta</td>
</tr>
<tr>
<td>2</td>
<td>Abeokuta</td>
<td>Family FM, 88.5, Moshood Abiola Way, Abeokuta</td>
</tr>
<tr>
<td>3</td>
<td>Abeokuta</td>
<td>Fresh FM 107.9, Abeokuta</td>
</tr>
<tr>
<td>4</td>
<td>Abeokuta</td>
<td>NTA, Ogbe, Abeokuta</td>
</tr>
<tr>
<td>5</td>
<td>Abeokuta</td>
<td>Ogun State Broadcasting Corporation, GRA, Abeokuta</td>
</tr>
<tr>
<td>6</td>
<td>Abeokuta</td>
<td>Ogun State Television, Ajebo Road, Abeokuta</td>
</tr>
<tr>
<td>7</td>
<td>Abeokuta</td>
<td>Paramount FM 94.5 FM, Abeokuta</td>
</tr>
<tr>
<td>8</td>
<td>Abeokuta</td>
<td>Rock City FM, 101.9FM, Asero, Abeokuta</td>
</tr>
<tr>
<td>9</td>
<td>Abeokuta</td>
<td>Smash FM, 88.1 FM Moshood Abiola way, Abeokuta</td>
</tr>
</tbody>
</table>

Source: Researcher’s field survey, 2019.

**Sample Technique**
The sample technique used in this study is simple random sampling which was used to select 50 female journalists from the media houses in Abeokuta, Ogun State. In order to achieve the aim and objectives of this study, five media houses were randomly selected using simple random sampling. The nine media house were given number 1 to 9 and these numbers were tagged with each of the media house (that is, 1-black pride magazine, 2-Family FM, 3-Fresh FM, 4- NTA Abeokuta, 5-OGBC, 6-OGTV, 7-Paramount FM, 8-Rock City FM, 9- Smash FM). In addition these papers were rolled and put in a bowl and mix together to avoid bias. Then five numbers were picked and they were 1, 3, 4, 6 and 8 which represents Black Pride Magazine, Fresh FM 107.9, NTA Abeokuta, OGTV, and Rock City FM. This method gives equal chances for all the media houses under study and the selection of one does not affect the other. Moreover, the sample selection was done without replacement. Hence, the list below shows the lists of media houses selected for this study in Ogun state.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Ogun State</th>
<th>Lists of Selected Media House</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abeokuta</td>
<td>Black Pride Magazine, Idi-Aba, Abeokuta</td>
</tr>
<tr>
<td>2</td>
<td>Abeokuta</td>
<td>Fresh FM 88.5, Moshood Abiola Way, Abeokuta</td>
</tr>
<tr>
<td>3</td>
<td>Abeokuta</td>
<td>NTA, Ogbe, Abeokuta</td>
</tr>
<tr>
<td>4</td>
<td>Abeokuta</td>
<td>OGTV, Abeokuta</td>
</tr>
<tr>
<td>5</td>
<td>Abeokuta</td>
<td>Rock City FM, 101.9</td>
</tr>
</tbody>
</table>

Source: Researcher’s field survey, 2019.

After selection of the media houses in Ogun states, each of these media houses was visited and purposive sampling was used in the distribution of the questionnaire. The method involves distributing copies of questionnaire to the first 10 female journalists in each of the media houses. This procedure was used throughout all the 5 selected media houses.

### 3.5 Research instrument

The instrument that was used in obtaining data for this research work was the questionnaire. A well-structured questionnaire was used for this research work which consists of open and closed ended questions. A questionnaire is a research instrument consisting of series of questions arranged in a logical sequence for the purpose of gathering information from respondents. Tejumaye, (2003) observed that the structure of questions. The approach used in asking questions as well as physical attributes of a questionnaire can positively or negatively affects the response rate. The questionnaire would two sections. Section A of the questionnaire would deal with the respondents’ personal data (demographic data) while section B would be wholly centred on responses given by the respondents. These items addressed each question for uniformity purpose; the questionnaire was kept short and structured with four scales; that is, 4 for strongly agree, 3 for agree, 2 for disagree and 1 for strongly disagree, that is, four Likert scale.

### Validity of Research Instrument

Validity is the extent to which any instrument measures accurately that which it purports to measure. The instrument used (structured questionnaire) contains items that could actually measure what the research intends to measure accurately. The validity of the constructs in the questionnaire was ascertained using the face validity and content validity. The face validity was carried out by giving a copy of questionnaire to my supervisor in the department. The relevance of each item was
accessed in relation to the objectives of the study. The instrument was validated by effecting necessary corrections and examining the contents and ascertaining clarification of ideas as well as appropriateness of its items.

**Instrument**

For the purpose of this study, the questionnaire was used for the collection of data. The questionnaire titled Information Literacy Skill, Computer Self-efficacy and E-resources Use (ICUE) was developed by the researcher. The questionnaire helps from a relatively large population within the specified time limit. It was divided into five sections to help provide information which are responses form respondents.

**Method of Data Analysis**

The data collected for this study were coded and analyzed through the use of descriptive and inferential statistics. Descriptive statistics such as frequency distribution, percentages, mean and standard deviation were used to analyze the research questions. Hypotheses one and two were subjected to inferential statistics using Pearson Product Moment Correlation (PPMC) analysis.

4. **DATA ANALYSIS, RESULT AND DISCUSSION OF FINDINGS**

**Presentation of Hypothesis**

**Hypothesis One**

\[ H_0: \text{there is no significant relationship between Information Literacy Skills and E-resources use among female journalists in Ogun State.} \]

In order to test the hypothesis and analyze the data, a Pearson Correlation (PC) was employed. This involves pooling respondents’ scores on each item measuring information literacy skills to arrive at the composites score: the same procedure was applied for e-resources use. A relationship test was then carried out by associating both information literacy skills and e-resources use, the analysis result is summarized and presented in Table 4.1

**Table1: Summary of the relationship between Information literacy skill and e-resources use**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>df</th>
<th>R</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information literacy skill</td>
<td>50</td>
<td>3.29</td>
<td>0.53</td>
<td>48</td>
<td>0.67</td>
<td>.001</td>
</tr>
<tr>
<td>E-resources Use</td>
<td>50</td>
<td>3.00</td>
<td>0.68</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In Table 1, the analysis result presented indicates that there is a significant positive correlation between information literacy skill and e-resources use (R=0.67, P<0.05). Based on the finding, information literacy skill of female journalist increase the use of electronic resources. Therefore, the null hypothesis which states that there is no significant relationship between information literacy skills and e-resources use among female journalists in Ogun state is rejected and the alternate hypothesis is accepted, that there is significant relationship between information literacy skills and e-resources use among female journalists.

**Research Question 2:**

What is the level of computer self-efficacy of female journalist in Ogun state?

**Hypothesis Two**

\[ H_0: \text{there is no significant relationship between computer self-efficacy and e-resources use among female journalists in Ogun State}. \]

The hypothesis was tested using a Pearson Correlation (PC). The analysis procedure involves pooling respondents’ scores on each items measuring computer self-efficacy to arrive at the composites score; the same procedure was applied for e-resources use. There composite score were subjected to test of relationship, the analysis result is summarized and presented in Table 4.2.

**Table 2, Summary of the relationship between computer self-efficacy and e-resources use among female journalists in Ogun state.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>df</th>
<th>R</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer self-efficacy</td>
<td>50</td>
<td>3.29</td>
<td>1.65</td>
<td>48</td>
<td>0.76</td>
<td>.001</td>
</tr>
<tr>
<td>E-resources Use</td>
<td>50</td>
<td>3.32</td>
<td>0.68</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The analysis result presented in Table 2 indicates that there is significant positive relationship between computer self-efficacy and e-resources use (R=0.76, P<0.05). The result indicated that female journalists who display a high level of computer self-efficacy tend to use electronic resources more than those who demonstrate low level of computer self-efficacy. Hence, the higher the level of computer self-efficacy, the better the use of e-resources among female journalists. Therefore the null hypothesis which stated that there is no significant relationship between computer self-efficacy and e-resources use...
among female journalists in Ogun state is rejected, then it is concluded that there is significant relationship between self-efficacy and e-resources use among female journalists in Ogun state.

Research Question 3:

How does combined effect of information literacy skill and computer self-efficacy impacted on the use of e-resources among female journalists in Ogun-state.

Hypothesis Three

Ho 3: the combined effect of Information Literacy skills and computer self-efficacy does not have a significant joint influence on e-resources use among female journalists in Ogun state.

This hypothesis was tested by employing multiple regressions; the analysis procedure involved regressing information literacy skills and computer self-efficacy on e-resources use. The result of the analysis presented in Table 4.3

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Square</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>3103.32</td>
<td>2</td>
<td>1551.66</td>
<td>6.6524</td>
<td>0.034**</td>
</tr>
<tr>
<td>Residual</td>
<td>11195.95</td>
<td>48</td>
<td>233.249</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>R=0.89 SQuar-0.79</td>
<td>Adjusted R-Square0.76</td>
<td>Standard error of the estimate = 4.83</td>
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It is shown in Table 3 that the joint influence of information of information and computer self-efficacy on e-resources was significant (F=6.6524; R=0.89, R²=0.79, Adj. R²=0.76; p<0.05). There exits strong positive relationship between the joint effects of information literacy level and computer self-efficacy on e-resources use with correlation efficient of 0.89. Also, 79% of the variation in e-resources utilization was jointly accounted for by information literacy skills and computer self-efficacy. Therefore, the null hypothesis was rejected. Then it is evidenced that information literacy skills and computer self-efficacy are good predictors of e-resources use. This is significant and adequate in relating the variables under consideration. Hence, we accept the alternate hypothesis that the combination of information literacy skills and computer self-efficacy has significant joint influence on e-resources use among female journalists in Ogun state.

Discussions of Findings

The findings show that there was a significant positive relation between literacy skills and computer self-efficacy resources use among female journalists (R=0.67, p < 0.05). The hypothesis was tested with Pearson Correlation Coefficient by associating the respondents’ scores on information literacy scale with those of electronic resources use. The findings indicate that as the level of information literacy skills improves, the use of electronic resources also increases. The findings confirmed that information literacy skills go a long way in explaining the level of electronic resources use. It simplifies female journalists who possess a high level of information literacy skills are more likely to display better electronic resources usage than those whose level of information literacy skill is low.

The second hypothesis which stated there is no significant relationship between computer self-efficacy and electronic resources use was rejected based on the analysis result. The findings show that there was a significant positive relationship between computer self-efficacy and electronic resources use among female journalists (R = 0.76, p < .05). The findings implied that as the level of computer self-efficacy increases, the level of electronic resources use also increases. The findings show that the use e-resources dependent on computer self-efficacy. The findings of the study confirm the self-efficacy theory of Bandura (1986) who claimed that people are more likely to execute certain task if they believe they have the skills and ability to perform such actions.

The third hypothesis which stated that information literacy skills and computer self-efficacy do not have a joint influence on electronic resources use among female journalists was rejected based on the analysis result. The findings revealed that, information literacy skills and computer self-efficacy jointly predict the use of e-resources among female journalist (F=6.6524; R=0.89, R²=0.79, Adj. R²=0.76; p < 0.05). The findings show that information literacy skills and computer self-efficacy explained 79% variation in the use of electronic resources among female journalists.

In order words, effective utilization of technology-based resources will depend on information literacy skills and computer self-efficacy of female journalist among other factors.

In summary, the study examines the influence of information literacy skills and computer self-efficacy on electronic resources use by female journalists in Ogun state. In order to carry out the study, female journalists in Abeokuta was selected to represent the female journalists’ population in Ogun state in Nigeria. From the analysis of data and the consequent testing of research hypothesis, the following are the research findings and conclusion drawn.

1. The information literacy skills of the respondents significantly correlated with their use of e-resources (R = 0.67, p<0.5) (Table 1)
2. The information literacy skills of the respondents significantly correlated with their use of e-resources (R = 0.786, p<0.5) (Table 2)
3. The combination of information literacy skills and computer self-efficacy jointly influenced the respondents’ e-resources usage (F = 6.6524; R = 0.89, R² = 0.79, Adj. R² = 0.76; p<0.05) (Table 3)

CONCLUSION AND RECOMMENDATIONS
5.1 Conclusion
The new technologies utilization has been highly promoted through the advancement in information and communication in recent years. Electronic resources were highly preferred by female journalists because of their availability and ease of use. Female journalists always find it easy to surf the internet for obtaining materials that will aid their work and research activities. Use of electronic resources provides access to current information and thereby improves female journalist’s information performance. Based on the findings of this study; two major factors were identified as significant factors which predict female journalists degree of usage of electronics resources. The findings show that individual’s level of computer self-efficacy is a significant determinant of their degree of electronic resources use. It was found that high level of computer self-efficacy is positively associated with electronic resources use among female journalists. However, information literacy skills were also found to play an important role in determines female journalist’s degree of electronic resources use. The findings show that female journalists’ ability to discover the need for information as well as search skills predict their level of electronic resources use in the information environment. The findings also indicated that information literacy skills and computer self-efficacy jointly influence the use of electronic resources. Therefore, female journalists who possess computer self-efficacy as well as information literacy skills are more likely to engage in the use of e-resources which are technologically indicated.

5.2 Recommendation
Based on the findings of this study the following recommendations are made:
Based on the high frequency of the e-resources as found by the study, the owners of media houses should ensure that e-resources with adequate information and communication technology tools are subscribed to regularly as this will encourage female journalists to constantly engage in e-resources usage to improve their professional/information performance.
Female journalists should see it as a point of duty to engage and update their computer skills regularly in order to be highly skilled in various aspects of information literacy and computer skills as this ensure a continuous and more effective utilization of e-resources among the journalists.

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REVIEW OF CONTRIBUTIONS OF WOMEN IN TECHNOLOGY: SHAPING THE FUTURE

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ABSTRACT

In Nigeria young men are almost twice as likely to have a career in computer science and technology-related fields as women. According to the National Bureau of Statistics, women make up on average just 22% of the total number of Engineering and Technology university graduates each year (www.nigerianstat.gov.ng). The same source also affirms that women make up roughly a fifth of the total number of people working in information and communication technology sector. However, it is not only about the numbers. It is about enriching and complementing your workforce with the diverse qualities and perspectives of women, research has shown that better and more useful tools are created when the developers of such tools fully represent the diversity of the societies we live in. This means that, to get fully functional and universally acceptable inventions, the opinion of women have to be taken into consideration. This paper shows the impact women will play in the future of technology while examining the challenges they face in their pursuit of academic and career excellence, it further presents irrefutable evidences of women who have affected the entire world with their inventions in time past and those who are making waves with their continuous innovative efforts at bringing technology to its peak at present.

KEYWORDS: Women in technology, Gender gap, Women career in stem

1. INTRODUCTION

The minds of many reasons that a woman's place is “only” in the home. They believe that a woman should be seen but never heard. It rankles the sensibilities of such people when they see women making waves in the world around them. This has been the case in many places all over the world (Dina, 2017). For a long time, women in Nigeria and other parts of Africa have been a disadvantaged group when it comes to educational and career opportunities in the STEM (Science, Technology, Engineering and Mathematics) field. Most girls in schools were encouraged to take courses that were regarded easier and more adaptable to being a wife and a mother, while avoiding male-dominated areas such as engineering and technology. Nigeria, like many other African societies, is built on patriarchalism, which encourages male dominance in all the major aspects of life. The dominance of the male gender is very much conspicuous in the Science, Technology, Engineering and Mathematics (STEM) fields of the Nigerian academia. Being a specialized field, given its complexity and thoroughness, the Sciences are mostly considered an area exclusive for men. According to Rabia Salihu Sa’id (2015), “Nigerian women make up only 17 percent of all science researchers in the country.” In another report by Adefunke Ekine and Negar Ashtari Abay (2013), it is estimated that “overall, women make up just under 35 percent of students in these science faculties.” Clearly, the Nigerian society is structured to make the Sciences unattractive to the female gender. According to Rabia (2015), “Some girls feel more comfortable choosing a shorter course in the arts or social sciences, so they can avoid the pressure of getting married while still studying.” However, this is gradually changing. In Africa, we are experiencing the rise of women to prominent positions of power as is being experienced in Liberia, Mauritania and Ethiopia. In each of these countries positive changes have been observed since a more gender – equality based approach was adopted.

Just as the evidence suggests that a more gender inclusive political system may lead to better policies for women and girls (Chattopadhyay and Duflo, 2004), and integrating women into corporate boards may mean reaching new consumers, not to mention higher profits (Joy, Harvey, Sriram, 2007), there is a case to be made for increasing women's presence in developing technology and innovation.
It seems like today’s women are better positioned than ever before to rise to leadership roles in technology. Not only do companies have many kinds of support structures in place, such as women’s networks and leadership development courses, but there are increasing numbers of women at the top who can serve as role models or inspiration.

Nevertheless, women are still a distinct minority in the technology workforce – and an even smaller proportion of corporate leadership. The numbers are appalling: women make up less than 25% of the STEM (Science-Technology-Engineering-Mathematics) workforce in the world. Data from the US National Science Foundation shows that between 2000 and 2014, the number of women graduating with a degree in computer science actually declined. (www.nsf.gov/nsb/sei/edTool/data/college-14.html)

A youth survey report issued by the National Bureau of Statistics, in Nigeria young men are almost twice as likely to have a career in computer science and technology-related fields as women. According to the National Bureau of Statistics, women make up on average just 22% of the total number of Engineering and Technology university graduates each year. Furthermore from the same source, women make-up roughly a fifth of the total number of people working in information and communication technology sector. (https://wtec.org.ng/the-gender-gap/)

Why does this under-representation of women matter? Research shows that diverse teams perform better. Individuals from different genders, races, backgrounds and experiences bring different perspectives that can lead to innovative solutions.

Despite the daunting challenges and the discouraging numbers; Women have made significant contributions to the development of new technologies, overcoming many barriers to study and work. In years past, women have been barred from colleges and universities, denied the opportunity to work in certain fields, and had their work obscured or stolen by male scientists. As a result, the history of technology is told as a story of great men. However, there were many women in times past who shaped the technology that we use daily along with others who continue to strive to improve the technology currently available to world and others strive in the field of technological education to build up a more female – inclusive technological world thereby inspiring women to go into technological careers.

2. **CHALLENGES THAT WOMEN FACE IN THE PURSUIT OF A CAREER IN STEM**

As women continue to try to make a path for themselves in the science and technology industry, many challenges beset their earnest strives. Some of the challenges these women face include:

**Innovation as reflected in patents is still male dominated:**
In the United States, proportion of patents including at least one woman inventor increased from 3.4 percent in 1977 to 18.8 percent in 2010, but under 8 percent of all patents have women as primary inventors (Milli, Williams-Baron, Meika, Xia, and Gault, 2016). Looking across the subset of commercialized patents, Hunt, Jean-Phillipe, Herman, and David, (2012) suggest that only 5.5 percent of holders are women. This is a global problem: across the world, women accounted for about 10 percent of patent authorships weighted by the number of names on each patent in 2013 (Sugimoto, Lariviere, Ni, Gingras, & Cronin, 2014).

**Women inventors cluster around “traditional female roles”:**
In the United States, above 50 percent of patents in the field of “chemistry: natural resins or derivatives” include a woman inventor, but women are usually the primary inventor in patent technologies associated with traditional female roles: the two top-ranked patent classes with women as the primary inventor are “travel goods and personal belongings” and “jewelry, symbolic insignia and ornaments” (Milli et al., 2016).

**Overall education rates are not the source of the problem, but specific concentrations are still part of it:**
Huyer (2015) finds that worldwide women represent 53 percent of bachelors and masters graduates and 43 percent of Ph.D graduates. In the United States, where women are almost as likely as men to have a science or engineering degree, Hunt et al. (2012) suggest only 7 percent of the gap in commercialized patents is accounted for by the lower probability that a woman holds such a degree. The patenting gap largely exists because in contrast to men women with such degrees are scarcely more likely to hold a patent than women without such degrees. One factor behind this mismatch between the number of science and engineering degrees overall and patenting performance is the particular disciplines studied engineering is a patent-rich discipline but one that attracts comparatively few women. In 2010, women accounted for 58 percent of biological science degrees and 39 percent of physical science degrees in the United States, but only around 20 percent of engineering and...
computer science degrees (Milli et al., 2016). The United States sees one of the lowest shares of women among engineering graduates in the world significantly lower than many developing countries, and less than one half the proportion of Denmark, Poland, or Malaysia. But even these comparatively equal countries only see women making up a third or so of graduating classes in engineering (Huyer, 2015).

Women do not apply for public funding as often as men, and private funding for innovation also largely goes to men:
In the United States, women at particular career stages are less likely to apply for competitive grants for which they are eligible (Ovseiko, Alison, Laurel, Sue, 2016). Only three percent of venture capital funding in the United States went to businesses with a woman CEO between 2011 and 2013 (Milli et al., 2016).

3. WOMEN WHO CHANGED THE WORLD OF STEM IN NIGERIA AND ABROAD
In the era when women were not readily reckoned with as been important in the STEM field, a few women made their mark in the world of technology and some of their inventions have improved the quality of life for many people over the world. Also, amale-dominated space in the field obscures the reality that there are some women, although in the minority, who have excelled tremendously in the areas of STEM in Nigeria and world over. Some of these women are herein under-listed together with their achievements:

Grace Alele-Williams
The academic life of Professor Grace Alele-Williams defies the traditional thoughts about the place of women in the society. She symbolizes the excellence a woman could achieve, if given the opportunity. Professor Alele-Williams is a first at different levels of achievements. She is the first Nigerian female to earn a Ph.D. in Mathematics, the first female Professor of Mathematics, and the first female Vice Chancellor of a University in Nigeria. She received her university education at the University of Ibadan, the University of Vermont and University of Chicago, respectively.

Finding herself in the “space age”, which symbolized the era of stiff competition between the two major powers (the United States and the Soviet Union) over scientific discoveries, Alele-Williams increasingly developed interest in Mathematics in the US. Professor Alele-Williams’ interest was further buoyed by her stint at the African Mathematics Program in Newton, Massachusetts, under the mentorship of MIT Professor Ted Martins.

Besides being a former Vice Chancellor, Alele-Williams has held different leadership positions in the development of Science education at local and international levels. She was Chairman, Curriculum Review Committee in 1973 and a member of the Governing Council of UNESCO Institute of Education. She held the position of Vice President of the World Organisation for Early Childhood Education and a Regional Vice President for Africa of the Third World Organization for Women in Science. Alele-Williams received the National Honor of the Order of the Niger in 1987 and was a member of the Vision 2010 Committee. (Wikipedia, May 2019)

Francisca Nneka Okeke
Professor Nneka Okeke is by all standards a distinguished scientist who has made tremendous contributions to her field – Physics. Professor Okeke gained international prominence after winning the highly respected L’Oreal-UNESCO Women in Science Award worth USD 100, 000 in 2013. The award was in recognition of her notable contributions to the understanding of daily variations of the Ion currents in the upper atmosphere. Presently a Professor at the Department of Physics and Astronomy in the University of Nigeria, Nsukka (UNN), Okeke was the first female Head of the Department and a former Dean of the Faculty of Physical Sciences in her university.

Born in an environment where female education was discouraged, Okeke was motivated to study Physics by her father, a Mathematician, whom she saw as a mentor. As a young girl, she was very inquisitive and asked intelligent questions about nature and objects around her. She was particularly interested in knowing the wonder behind airplanes and how they fly without falling on the earth. Professor Okeke is exceedingly passionate about the education and empowerment of women particularly in the Sciences. As HOD and Dean at UNN, she was instrumental to the employment of more women in the faculty. From her mentorship of young women, one of her Ph.D products was a recipient of the AU-TWAS young scientist Award in 2010. Professor Okeke has successfully supervised 12 Ph.D and about 28 M.Sc. students. (Wikipedia, May 2019)

Deborah Ajakaiye
Professor Deborah EniOjakaiye is Africa’s first woman to be appointed a Professor of Physics in 1980. Ajakaiye completed her Ph.D in Geophysics at the Ahmadu Bello University (A.B.U.), and her Master and Bachelor’s degrees at the University of Birmingham and University of Ibadan, respectively. She lectured at
Ahmadu Bello University and later the University of Jos where she rose to the position of Dean in the Faculty of Natural Sciences. Her contributions to the field of Geophysics through her works on ‘Geovisualization’ has been significant in Nigeria’s location of its abundant mineral resources.

Professor Ajakaiye has been recognized at local and international forums. She was awarded by the Nigerian Mining and Geosciences Society. She was also the first black African to be named a Fellow of the Geological Society of London. Professor Ajakaiye was one of the 50 Women of Distinction awarded by the First Lady, Dame Patience Goodluck Jonathan in 2010, in celebration of Nigeria’s 50th independence anniversary. Ajakaiye is currently working with the NNPC on its drive for alternative crude oil reserves with the exploration of the inland sedimentary basins in other parts of Nigeria. (Wikipedia, June 2019)

Olabisi Ugbebor

Professor Olabisi Ugbebor is dubbed the “Queen of Mathematics” for her outstanding record in Mathematics. Professor Ugbebor studied at Queen’s College, Lagos on G.B. Ollivant Scholarship for her West African School Certificate Course (WASC), and because of her brilliant academic performance the scholarship was specially extended for her to cover the Cambridge Higher School Certificate Course also at Queen’s College, Lagos. Following her brilliant performance at the Higher School Certificate Course, the Federal Government of Nigeria awarded her a scholarship to study Mathematics at the University of Ibadan from 1969-1972, where she was the only female in a class of seven Mathematics majors.

She graduated from the University of Ibadan in 1972 with a Second Class Upper Honours degree in Mathematics. Again, on account of her outstanding academic brilliance, she was given a scholarship by the University of Ibadan to undertake Postgraduate studies at the University of London. She was awarded the Postgraduate Diploma in Statistics at the University College London in 1973 from the first university statistics department in the world. She then embarked on her Ph.D degree course in Mathematics in 1973 at the University of London, which she completed in 1976 at the age of 25. After obtaining her Ph.D degree in 1976, Professor Ugbebor returned to the University of Ibadan and joined the Department of Mathematics, where she rose to become a Professor, thus making history as the first woman to attain that position in the department at the University of Ibadan. At different occasions, she also served as the Acting Head, Department of Mathematics.

In 2014, Professor Ugbebor was elected the first President of Nigerian Women in Mathematics at the Inaugural Meeting of the Nigerian Women in Mathematics. Some of her products have recorded outstanding achievements in the discipline of Mathematics. These include Professor Steven Onah, the Head of National Mathematical Center and Professor Ayoola, a former Deputy Vice-Chancellor (Academics) at the University of Ibadan. (Wikipedia, June 2019)

Adenike Ososfan

Professor Adenike Oyinlola Ososfan is the first Nigerian female to hold a doctorate in Computer Science, and the first female Professor of Computer Science in Africa. In addition to her specialization in Computer Science, Ososfan also excelled in Business Administration as she received the best result in the 1993 MBA class of the University of Ibadan. As Head of the Department of Computer Science at the University of Ibadan, Ososfan began post-graduate programmes in the department and her tenure has recorded more staff with Ph.D degrees. Ososfan made history as the first woman to serve as President and Chairman of the Computer Professionals Registration Council of Nigeria between 2005 and 2009. Professor Ososfan was also the Pioneer President, Nigeria Women in Information Technology (IT). (Wikipedia, May 2019)

Chinedum Peace Babalola

Professor Chinedum Peace Babalola is the first female Professor of Pharmacy at the University of Ibadan. She is also the first female Pharmacist in Nigeria to be inducted as Fellow of Academy of Science (FAS). Babalola obtained all her degrees at the Obafemi Awolowo University (O.A.U.), with specialization in Pharmacokinetic Option in her doctorate. Professor Babalola is notable for her research that produced a novel high-performance liquid chromatography method for the analysis of quinine in biometrics. This outstanding research led to the elucidation of the pharmacokinetics of quinine in Africans and formed the basis of dose optimization in malaria patents.

Professor Babalola is one of the scientists that produced the first pharmacogenetic study in healthy and sickle cell patients in Nigerians. Currently, the Dean of Faculty of Pharmacy University of Ibadan and Adjunct Professor in Genetic & Bioethics unit, IMRAT, College of Medicine University of Ibadan, Babalola is a Fellow of the African Academy of Sciences and the Nigerian Academy of Science. Professor Babalola’s research earned
her selection alongside Dr. Adeboye Adejare of the University of the Sciences in Pennsylvania for research on the interaction between compounds and small endogenous compounds as targets for drug action.

**Hedy Lamarr**: The world owes her a much greater debt. She is the co-inventor of frequency – hopping and spread spectrum; techniques that were used to shield military and other sensitive communications during World War II are now used in Wi-Fi and Bluetooth technologies. (Source: http://www.ecpi.edu).

**Frances Spence and Kay McNulty Mauchly Antonelli**: The work of Frances Spence and Kay McNulty Mauchly Antonelli also known as “The Human Computers” helped shape the outcome of World War II. They worked during an era where a computer was a person who calculated sums, and during the war, computers were mostly women. Performing these calculations by hand, or even simple machines, was too slow for a war that moved at the speed of flight, so they were chosen to help program the first electronic digital computer, known as ENIAC, in 1946. (Source: http://www.ecpi.edu).

**Ellen Ochoa**: She took women's technological innovations to the stars through her work with NASA. She developed optical inspection and image refinement methods for automated examinations of images from space. Ochoa became the first Latina to head NASA Johnson Space Center. (Source: http://www.ecpi.edu).

**Katherine Johnson**: Born in 1918, Katherine Johnson, graduated from university at 18. She was awarded the Presidential Medal of Freedom in 2015 for a lifetime of work as a pioneering physicist, mathematician and space scientist. She and her colleagues, Dorothy Vaughan and Mary Jackson did the calculations that guided NASA’s 1962 Friendship 7 Mission. (Wikipedia, 2019)

**Augusta Ada King**: She is best known for writing the first computer algorithm during her collaboration with Charles Babbage on the Analytical Engine. (Wikipedia, 2019)

**Radia Perlman**: Radia Perlman disapproves when people call her The Mother of the Internet. But as an early computer scientist and student of MIT in the 60's she became an internet pioneer, developing the algorithm behind the Spanning Tree Protocol (STP), an innovation that made today's Internet possible. She also invented TRILL to correct limitations of STP. (Wikipedia, 2019)

**Rear Admiral Grace Hopper**: An American computer scientist, and a Rear Admiral in the US Navy, Grace Hopper invented the first programming language to use English words. She is seen as a key inventor of the languageCOBOL (an acronym for Common-Business-Oriented-Language) a widely used programming language. (Wikipedia, 2019)

4. **PROGRAMMES BUILDING UP THE INTEREST OF GIRLS AND WOMEN IN THE STEM FIELD**

Several organizations and individuals have taken the bull by the horns and are creating opportunities for women to get involved in the study of STEM programmes, and ultimately work and become experts in the field. In Nigeria, there are several initiatives that help to educate women and girls in areas of STEM such as coding and programming. These initiatives are geared towards one purpose; encouragement and empowerment of women and girls to participate in technology-related fields. There are various areas of focus, including getting girls interested in ICT-related education and careers, removing limitations and barriers culturally and socially, increasing the participation of women in STEM careers, and providing the required training and opportunities for women and girls to thrive in the STEM field.

Some of the organisations involved in this work include:

**Women's Technology Empowerment Centre(W.TEC)**

A pioneer organisation in this work is Women's Technology Empowerment Centre (W.TEC). W.TEC is a Nigerian non-governmental organization working for the economic and social empowerment of girls and women, using information and communication technologies (ICTs). W.TEC was one of the first organizations working in the gender and technology space in Nigeria. Since 2008, they have worked hard to educate the wider public about the importance of gender equality in technology through training, speaking at conferences, hosting public discussions, media interviews and presenting their results and alumnae. W.TEC's programmes comprise of technology literacy training, technology – based projects, mentoring and work placement. W.TEC also researches and publishes works examining pivotal issues related to how African women use technology, barriers preventing or limiting technology use, and strategies for more efficient technology use. Their objectives are for Nigerian women to develop financial independence by: training for ICT-specific jobs, like computer
engineer, programmer, system analysts, hardware and network specialists, designers; developing technology skills that can be used for other ICT-reliant jobs or self-employment. We also want women to develop skills and confidence to use ICTs for activism, learning, awareness-raising and advocacy for a better quality of life. (https://wtec.org.ng/about-us/)

**High-Tech Women** – This an NGO that works with women and youths to empower them through ICT for research, entrepreneurial development, competitive advantages and wealth creation. With a vision to ensure that every woman and youth in Nigeria is ICT literate and can use it to create wealth, High-Tech Women carries out training a in technology for young people, in collaboration with schools, churches and government agencies.

**Pearls Africa Foundation** – Abisoye Ajayi-Akinfolarin who in 2012 founded Pearls Africa Foundation is another name to reckon with in that she was the one who started Girls Coding, which equips young girls with functional IT skills that will create economic independence. Girls aged between 10 and 17 years are taught programming, UI design and animation. They also get to relate with female mentors in the technology space. (https://pearlsafrica.org/about-us)

**Inspire IT** – This is an organization, founded by Nuela Adanna Ononiwu 2014, and focuses on mentoring girls in basic computer skills, programming skills and information technology consultancy. More than thirty girls have been mentored by Nuela via the initiative which took off in 2014. She hopes to see more women and girls connect through the mentoring programme.

**Code IT** – Another initiative is Code IT, which is aimed at developing young people in the area of computer science by focusing on building hardcore programming skills at an early age. The initiative, which targets children between the ages of 5 and 18, was founded by Damilola Anwo-Ade who is passionate about the development of IT skills in young people especially girls. CodeIT aims to train 10,000 children by the year 2020.

5. **WOMEN CHANGING THE WORLD OF STEM PRESENTLY**

Among some of the women who are currently leaving their indelible mark in the STEM industry worldwide are:

**Rabia Sa’id:**
Dr. Rabia Sallhu Sa’id is a great inspiration for the female scientists of the younger generation. Although she completed her Ph.D. in Physics in 2013, her contributions have speedily given her local and international recognitions as a foremost scientist. She was one of the winners of the Elsevier Foundation Awards for Early Career Women Scientists in the Developing World in 2015. She was featured in Nature (The International Weekly Journal of Science) and in the BBC Radio Program: Discovery Science. She was also listed on the BBC 100 inspirational women of 2015.

Currently an Associate Professor in the Department of Physics at the Bayero University in Kano (BUK), she was appointed Deputy Dean (female) at the Student Affairs between 2012 and mid-2016. Dr. Sa’id obtained her Ph.D in Physics from Bayero University, Kano. She holds an M.Sc. and B.Sc. in Physics from the same university. She also holds an M.Sc. in Environment and Development from the University of Reading in the United Kingdom; a study she undertook with a fellowship from the Ford Foundation in 2002. She spent four months in 2010 at the Institute of Applied Physics, University of Bern, Switzerland as a visiting research scientist, working with the renowned scientist in terrestrial and atmospheric remote sensing, Prof (Dr.) C. Matzler.

She is a volunteer for several non-governmental organizations including the Virginia Gildersleeve International Fund. She mentors girls and boys in the STEM field for which she volunteers a

**Folasade Olajuyigbe, Ph.D**

In world dominated by men, one of Nigeria's bright lights and a globally renown scientist, Folasade Olajuyigbe, Ph.D. who is also a senior lecturer in the Department of Biochemistry, Federal University of Technology, Akure (FUTA), reached a new high when she was announced the winner of the 2017 Fulbright African Research Scholar Programme (ARSP), award for advanced research in the United States for the 2017/2018 academic session. Following her award, the FUTA don is now affiliated with Rutgers, the State University of New Jersey. The Fulbright African Research Scholar Programme (ARSP) offers senior faculty members from top African universities the opportunity to conduct independent research at U.S. institutions. She was picked from a pool of 700-strong candidates who initially applied for the fellowship from Nigeria. Out of these, 16 were shortlisted for the interview, from where five finalists were picked. Olajuyigbe, whose research into enzyme biotechnology and
environmental health has won her recognition, will focus on this area during her stint in one of the most prestigious international exchange programmes in the world. Fulbright Scholars (Senior Research Program category) are highly motivated academics with strong academic background, professional achievements, high leadership potential, passion for increasing mutual understanding among nations and cultures and serious commitment to completing the programme and returning home. Olajuyigbe is all these and more and, what is more interesting is that she keeps going stronger in the field, both home and abroad. (The Guardian, May 2017)

Kimberly Bryant
Kimberly Bryant is doubly shaping the future of technology with her organization Black Girls Code. Bringing both innovation and diversity to programming, Black Girls Code makes programming careers accessible to a population historically shut out of STEM careers through a six-week course on coding and robotics. Performing these calculations by hand, or even simple machines, was too slow for a war that moved at the speed of flight, so they were chosen to help program the first electronic digital computer, known as ENIAC, in 1946. (Source: http://www.ecpi.edu, 2015).

Rana el Kaliouby
Many consumers struggle to understand new technologies and advances in computing. Rana el Kaliouby is helping computers understand us with her innovations in facial recognition and reading technology. One of the founders of Affectiva, her inventions help people on the autism spectrum read facial expressions, assist researchers as they track subjects’ emotional changes, and advertisers track reaction to campaigns in real time by reading viewers’ expressions. Performing these calculations by hand, or even simple machines, was too slow for a war that moved at the speed of flight, so they were chosen to help program the first electronic digital computer, known as ENIAC, in 1946. (Source: http://www.ecpi.edu, 2015).

Dr. Crystal Jensen
Technology must be accessible in order to improve people's lives. Dr. Jensen is the founder and president of Integrity Technologies, Inc. makes educational technologies available to Native and indigenous communities, which often lack technology-rich learning environments. Through online learning and social media, Jensen helps people access educational and economic opportunities and other information to improve the quality of life in traditionally marginalized communities. Performing these calculations by hand, or even simple machines, was too slow for a war that moved at the speed of flight, so they were chosen to help program the first electronic digital computer, known as ENIAC, in 1946. (Source: http://www.ecpi.edu, 2015).

Sandrine Mubenga
Improving energy efficiency and expanding the use of renewable energy sources will be one of the chief challenges of the 21st century. Sandrine Ngaulula Mubenga is helping us meet this challenge by developing a hybrid car that runs through hydrogen and solar-powered hydrogen fueling stations. Mubenga’s prototype reaches a maximum speed of 119 miles per hour, outpacing concerns about the effectiveness of hybrid cars. Performing these calculations by hand, or even simple machines, was too slow for a war that moved at the speed of flight, so they were chosen to help program the first electronic digital computer, known as ENIAC, in 1946. (Source: http://www.ecpi.edu, 2015).

Amy Sheng
Technological advances have rapidly improved access to health care. But your doctor's office may soon be as accessible as your mobile phone, thanks to Amy Sheng. Sheng’s team at CellScope is developing tools that work with mobile phones to connect with medical offices for remote examinations and tests. The hospital trials, if successful, could transform models for triage and monitoring chronic conditions. Performing these calculations by hand, or even simple machines, was too slow for a war that moved at the speed of flight, so they were chosen to help program the first electronic digital computer, known as ENIAC, in 1946. (Source: http://www.ecpi.edu, 2015).

6. CONCLUSION AND RECOMMENDATION

6.1 Conclusion
As more efforts are put into the education, training and opportunities creation for Nigerian women and in STEM fields, there is no doubt that women will become dominant participants in STEM in the near future. The need for more women in STEM roles goes beyond simple diversity or gender parity. It is not just a case of making the STEM workforce fair – more women are needed in STEM roles to make scientific innovations useful, and more importantly, safe. After all, how relevant can innovations really be if they do not even take into consideration the needs of half the population?
The seatbelt is an example of this point, when it was first invented, it was modelled solely on the physical attributes of men, so when it was first introduced as a safety measure in cars, several women and children died because their physicality had not been considered. (Barratt, 2018)

Without more women being present when these decisions are made; and a diverse range of women at that, STEM innovations, progressions and discoveries can only go so far. The ripple effects of women in STEM reach far and wide. As Wollaston, (2018) reflected at the WISE 2018 Awards, “science and engineering and tech are fundamental to the future of the planet, we need women to take their rightful place in creating that new future

Besides this, enabling women to flourish in the STEM workforce is worth a lot financially. According to a research undertaken in the UK by McKinsey Global Institute, gender parity in the STEM workplace could add up to $28 trillion (or 26%) to the annual global GDP by the year 2525.

As evidenced by the many women who have left their footprints in the sands of time with regards to the STEM field and the countless many who are making waves with their unique perspective and intellect, women are beginning to take a firm foothold in the industry and show a steady rhythm which will in time outpace their male counterparts in the STEM field as it is happening in every other field of human endeavour. Therefore, engaging women and girls in STEM sector work is not only the right thing to do from the point of social justice. It is also smart economics.

6.2 Recommendation

As seen from the above mentioned women who have braved the storm and are doing well for themselves in the STEM field; it is very possible for the girl-child to be successful in that field and even make giant strides towards the betterment of all. To enable this to be achievable, the following recommendations are suggested:

- **Sparking Interest:**
  The first step is getting young women interested in STEM education and careers at an early age. Although, schools do focus on subjects that are crucial to the foundations of engineering, such as math and science, but I think the link between the core subjects and the exciting, creative, and diverse careers within engineering that may appeal to young women is made clear to them at a time that is too late or not at all. This, in turn, could be a reason for the lack of girls considering a job in the industry. Also, companies need to showcase the work they do to spark STEM interest, such as hosting open days. At occasions like this the students may take part in a variety of activities, including behind-the-scenes tours, workshops, and talks from inspirational engineers. Parents and children can also ask questions about engineering careers, and find out more about the important role engineering plays in the world at large. I believe that today, young women need four influencers actively working together to identify their STEM potential and interest, encourage them and help them to develop, and provide opportunities for their interest to grow. These four influencers are; family (parents, siblings, etc.), school teachers and coaches, other role models, and industry.

- **Getting Educational Institutions on Board**
  Schools in Nigeria have really come a long way with regards to imparting knowledge, but further improvements are necessary. Parents must be encouraged to become advocates in the school system for their young daughters who show interest in STEM education. Teachers should be trained to recognize interest and be advocates for inclusion of young women who show interest and/or potential in STEM fields. And industry must partner with schools, colleges, and universities to provide scholarships, internships, and other programs that help young women pursue STEM education and careers. Government has a role to play in this as well by providing incentives to schools that develop programs to promote STEM education for young women.Giving teachers opportunities to visit companies and connect with women in STEM careers can entirely change the way they teach and promote STEM material. Connecting educators and industry leaders to more innovative and relevant curricula throughout the secondary school pathway also generates opportunities for female students and teachers alike to be mentored by successful women working in STEM. It is very powerful for female students to hear directly from women who have achieved academic and professional success in STEM fields. However, it is hard to know the right moment to pitch engineering to young people. Therefore, schools have a role to play and need to do more to instill in girls the confidence to opt for science and math at A-level, and employers need to do more to make their approach to recruitment and retention more female friendly.

- **Ensuring Equal Employment Opportunities**
  Hiring women for STEM positions is just the first step to what should be long and fulfilling careers. It is so
easy to hire a qualified young woman, put her on a STEM team, and check the box that says ‘I did my part by hiring a bright young woman to fill that STEM opening on my team.’ But making the hire is just the beginning. So often there are other issues related to corporate culture and team dynamics that must be addressed—issues that are sometimes overlooked or just plain ignored—and that surface after the hiring process. For example, a STEM team may be predominately male. Women who enter STEM professions may find themselves surrounded by senior-level men who have either never worked with a woman peer or have no desire to work with a woman as a peer. And, unfortunately, sometimes women who have finally been ‘accepted’ as a part of these teams may immediately view the ‘new girl’ as a threat and offer little or no help or support. Every team member must be educated so that they and management understand the importance of diversity and inclusion to the success of the entire team and the company. Companies need to see that retention initiatives are a long-term investment. When women and men have the same degrees and the same level of experience, there is no logical reason for men to make more money and have better professional opportunities. This unbiased method may yield results will bring about a more diverse workforce, further enabling recruitment and retention of talented women.

REFERENCES


PARASITE FAUNA OF TILAPIA SPECIES IN THE FEDERAL UNIVERSITY OF AGRICULTURE, ABEOKUTA (FUNAAB) RESERVOIR, ABEOKUTA, OGUN STATE, NIGERIA

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ABSTRACT

A survey of parasite fauna of Tilapia species (Family: Cichlidae) was carried out at The Federal University of Agriculture Reservoir, Abeokuta, Ogun State. A total of 450 specimen belonging to four species were examined for parasites using standard parasitological methods, out of which 72 (16.0%) were infected with various types of parasitic fauna. A total of three hundred and sixty six parasites belonging to four groups; a flagellate protozoan (*Ichthyobodo necatrix*), a species of annelid (*Piscicola sp.*), one species of nematode (*Cucullanus sp.*) and a cestode (*Caryophyllaeides sp.*) were recovered. The result showed low prevalence of infection as well as low parasite diversity. The four species of fish sampled were *Oreochromis niloticus*, *Hemichromis fasciatus*, *Sarotherodon galilaeus* and *Tilapia zilli*. The skin, gills, stomach and intestine were the location infected and the skin supported the highest burden. The result showed that there was no significant difference between male and females with regards to infection (X² 1.38, P>0.05). Also, size/age of fish did not influence the degree of infection in fishes (X² 0.44, P>0.05).

Keywords: Parasite, Tilapia, FUNAAB Reservoir, Prevalence

1.0 INTRODUCTION

Tilapia has become the third most important fish in aquaculture after carp and salmon; worldwide production exceeded 1,500,000 metric tons in 2002 (Parker and Parker, 2011) and increases annually. Because of their high protein content, large size, rapid growth (6 to 7 months to grow to harvest size) and palatability (Sayed, 2006), a number of tilapiine cichlids – specifically various species of *Oreochromis*, Sarotherodon, and Tilapia are focus of major aquaculture efforts. Tilapia fisheries originated from Africa. It has made prodigious progress in fish culture in warm waters. Once promoted as the “miracle fish”, several species of tilapia are widely distributed within the tropics during the 1950s. Up till date, enthusiasm for the species has become so high that it is described as the “aquatic chicken” or “chicken of the sea” (Cedric and Niel, 2007). However, apart from a significant disadvantage of the group (i.e., excessive reproduction in pond culture resulting in a large number of small unmarketable fish) in which several workable technologies are now available for raising some of the species or hybrids of tilapia on a profitable basis, many problems still remain to be solved in making this group serve as a future "aquatic chicken". Out of these problems, parasites and diseases need to be focused upon.

Fish are hosts to many adult parasites and larval forms, the adult of which occur in amphibians, reptiles, birds and mammals as well as predatory fish. Some of these parasites cause disease to fish, affecting their health and reproduction, making them fall easy prey to predators and some infect man. For example, *Clonorchis sinensis* causes hepatomegalias and cirrhosis (Choi et al., 2006) while *C. formosanus* has been reported to cause diarrhea, epigastric pain and indigestion (Chai et al, 2013). Very few are seriously harmful to fish. Most individual fish in wild or cultivated populations are infected with parasites but in great majority of cases, no significant harm appears to be caused to the host fish. Although, there are surprisingly few reports of parasites causing mortality or serious damage to wild fish populations, such effects often go unnoticed. Parasites in wild fish are only remarked upon when they are so obvious as to lead to rejection of fish by fishermen or consumers. In cultured fish population, however parasites often cause serious outbreaks of diseases. The presence of dense
population of fish kept in particular environmental condition may favour certain parasite species so that the parasite population increases in a very high level. In Nigeria, however, parasites and the diseases caused have not received any serious attention because bulk of fish locally produced and marketed are under artisanal extensive wild fish capture (Omoniyi and Olofintoye, 2001). However, with the demand outstripping supply, intensive culture of fish is gathering momentum. Therefore, survey knowledge of the parasite fauna of indigenous fishes is needed.

2.0 MATERIALS AND METHODS

2.1 The Study Site

The Federal University of Agriculture, Abeokuta (FUNAAB) Reservoir is located at the Fisheries section of the University farm. The 3-hectare reservoir was constructed by damming a seasonal stream (Alabata Stream) in 1997. Alabata lies within the South Western region of Nigeria, around latitude 7°10′N and longitude 3°2′E, with a prevailing tropical climate and annual rainfall of about 1037mm. The ambient temperature lies within 28°C in June and 36°C in February with an average annual temperature of 34°C. The vegetation presents an interphase between a tropical rainforest and a derived savannah. The reservoir is to provide water for other earthen ponds downstream, serve as a fishing ground and for research and educational purpose. The dominant families of fish found in the reservoir include Clariidae, Cichlidae, Bagridae, Hepsetidae, Cyprinidae and Centropomidae.

2.2 Field Procedure

At the reservoir, fish were captured using castnet of mesh size 5cm (2 fingers) and thickness of 210D/9. They were captured in the morning hours between 9:00am and 11:00am. The fishes were attracted using maggot and sometimes pelleted feed. Maggots were collected from poultry droppings nearby and pelleted feeds procured from the fish hatchery. Fishes captured were sorted out and the tilapiine groups found were transported alive to the laboratory. Other groups caught were returned to the Reservoir.

2.3 Laboratory Procedure

On getting to the laboratory, each specimen was identified and given an identification number. All the tilapias were sorted into taxonomic categories. Each specimen was further subjected to laboratory measurements. The total and standard lengths of each fish specimen were taken using a meter ruler built into a board with the head of fish pointed to left hand side. Length measurement was read to the nearest centimetre. The body weight of each specimen was taken to the nearest gram using a top loading Mettler electronic balance of Model DT 1000. The sexes of all specimens were identified.

2.4 Collection and Preservation of Parasites

In the laboratory, fish were individually examined for parasites. The skin and gills were examined with hand lens (magnification x15) for the occurrence of any ectoparasite. Subsequently, the fishes were dissected and different portion of the gut (oesophagus, stomach and intestine) were placed in saline solution which was isotonic to the endoparasite physiological medium. Extraction of parasites was done with the aid of forceps. The parasites were collected, counted and preserved in specimen bottles containing formalacetic acid (FAA) for subsequent identification. The specimen bottles were labeled with the date, location of collection and the name of the host.

2.5 Identification of Parasites

The parasites recovered were mounted on slides, viewed under the microscope (Model G 300 series) and drawn out for identification. Identification of parasites was done according to Khalil and Rolling (1997) and Ugwuzor (1987).
2.6 Statistical Analysis

Apart from descriptive statistic, chi-square test was also used in determining whether the distribution of parasite fauna in relation to fish size/age and sex differed in FUNAAB reservoir.

3.0 RESULTS

A total of 450 specimens of tilapine fishes from the reservoir were examined. The four species identified were *Sarotherodon galilaeus*, *Oreochromis niloticus*, *Hemichromis fasciatus* and *Tilapia zilli*. Out of which 208 were males while the remaining 294 were females. Of the 450 fishes examined, seventy two (16.0%) were infected by parasites. The number of fish examined with the number infected in each species is shown in Figure 1. *Oreochromis niloticus* had the highest level of percentage infection (37.5%), followed by *Sarotherodon galilaeus* (33.3%), *Tilapia zilli* (25%) and *Hemichromis fasciatus* (4.2%).

![Figure 1: Fish species examined and incidence of infection](image)

Twenty four (29.0%) out of the 224 examined were infected while *T. zilli* were least infected with eighteen (10.5%) out of the 171 samples examined. A total of three hundred and sixty six parasites belonging to four phyla; phylum *Protozoa* (class: Zoomastigophora), phylum *Annelida* (class: Hirudinea), phylum *Aschelminthes* (class: Nematoda) and phylum *Platyhelminthes* (class: Cestoda) were recovered from the skin, gills, intestine and stomach as shown in Table 1.

<table>
<thead>
<tr>
<th>Fish Species</th>
<th>Ecto parasite</th>
<th>Endo parasite</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S</td>
<td>G</td>
</tr>
<tr>
<td><em>Sarotherodon galilaeus</em></td>
<td>63</td>
<td>54</td>
</tr>
<tr>
<td><em>Oreochromis niloticus</em></td>
<td>147</td>
<td>60</td>
</tr>
<tr>
<td><em>Tilapia zilli</em></td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td><em>Hemichromis fasciatus</em></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>222</td>
<td>135</td>
</tr>
<tr>
<td><strong>% of Infeciton</strong></td>
<td>60.7</td>
<td>36.9</td>
</tr>
</tbody>
</table>

Three hundred and fifty seven (97.5%) parasites were ectoparasites found on the skin and gills, of which 95.9% are flagellate protozoans (*Ichthyobodo necatrix*) and 1.6%, annelids (*Piscicola sp.*). Nine (2.5%) were endoparasites found in the stomach and intestine, of which 1.6% are nematodes (*Cucullanus sp*) and 0.8% cestodes (*Caryophyllaeides sp*). The occurrence of parasites among the fish host is shown in Table 2.

### Table 2: Incidence Of Parasites Among Fish Host

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Class</th>
<th>% of infection</th>
<th>Fish species infected</th>
<th>No of parasites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ECTOPARASITES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Ichthyobodo necatrix</em></td>
<td>Zoomascigophora</td>
<td>95.9</td>
<td>Sarotherodon galilaeus</td>
<td>117</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Oreochromis niloticus</td>
<td>201</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tilapia zilli</td>
<td>33</td>
</tr>
<tr>
<td><em>Piscicola sp.</em></td>
<td>Hirudinea</td>
<td>1.6</td>
<td>Oreochromis niloticus</td>
<td>6</td>
</tr>
<tr>
<td><strong>ENDOPARASITES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Cucullanus sp.</em></td>
<td>Nematode</td>
<td>1.6</td>
<td>Hemichromis fasciatus</td>
<td>6</td>
</tr>
<tr>
<td><em>Caryophyllaeides sp.</em></td>
<td>Cestode</td>
<td>0.8</td>
<td>Tilapia zilli</td>
<td>3</td>
</tr>
</tbody>
</table>

Figure 2 shows the age class using the frequency distribution table. Out of the 450 fishes examined, 45 were juveniles, 312 pre-adults while the remaining 93 were adults.

In relation to size of fish in Figure 3, it was observed that pre-adults were more infected than the juveniles and followed by the adults. Pre-adults have a prevalence rate of 75%, followed by adults (16.7%) and finally juveniles with 8.3% infection.
Figure 3: Relationship between host age/size and incidence of infection

The males showed 20.8% infection while females showed 13.4% as depicted in Table 3. There was no significant difference between male and females with regards to infection ($X^2$ 1.38, $P>0.05$). Also, size/age of fish did not influence the degree of infection in fishes ($X^2$ 0.44, $P>0.05$).

Table 3: Relationship between Sex of Host and Incidence of Infection

<table>
<thead>
<tr>
<th>Fish Species</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Examined</td>
<td>Infected</td>
</tr>
<tr>
<td>Sarotherodon galilaeus</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>Oreochromis niloticus</td>
<td>51</td>
<td>18</td>
</tr>
<tr>
<td>Tilapia zilli</td>
<td>75</td>
<td>12</td>
</tr>
<tr>
<td>Hemichromis fasciatus</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>159</td>
<td>33</td>
</tr>
</tbody>
</table>

4.0 DISCUSSION

The 16.0% overall infection rate observed in the present study is low particularly when compared to the 62.7% and 48.4% infection rates reported in some freshwater fish from Ekiti State, Nigeria by Omoniyi and Olofintoye (2001). In the same vein, Keremah and Inko-Tariah (2013) also reported a higher prevalence of 90% and 82% in an integrated and unintegrated fish pond on *O. niloticus* in African Region Aquaculture Centre, Aluu near Port Harcourt, Nigeria while a prevalence of 51% was reported from Okhuaie River near Benin city by Okaka and Omoigberale (2002). However, an infection rate of 16.6% was reported from Asa River and its impoundment at Ilorin (Obano et al., 2010). It is worthy to note that infection rates vary greatly from one area to another, and this may not be unconnected with the fact that a number of factors like availability of intermediate hosts, and susceptibility of definite hosts amongst others determine to a large extent the rate of infection (Obano et al., 2010).
The results of this study shown in Table 2 revealed the occurrence of four groups of parasites infecting the cichlids in FUNAAB Reservoir. The protozoan, *Ichthyobodo necatrix* found mainly on the skin and gills accounted for 95.9% of the total parasites recovered. This goes in consonance with the findings of Donald, 2017 who also recorded highest prevalence of *Ichthyobodo necatrix* in Nile Tilapia in northern Costa Rica. This high prevalence rate may be attributable to the direct life cycles of protozoans as well as the metazoans, which are majorly ecto parasites. According to Woo, 2006 and Iyaji et al., 2009 all important metazoan parasites of fish have a direct life cycle, propagate rapidly and are readily transmitted among fish. *Ichthyophthirius multifiliis*, also a protozoan has been recorded to be one of the biggest responsible for significant economic losses in fish farms worldwide (Dickerson, 2006), and the second protozoan causing infections in Brazil, which proves its great adaption also in tropical areas (Wanderson et al., 2012). The infective stages are released into the water to reinfect the same host or spread through the fish population with exception of the blood protozoans. Apart from the absence of intermediate host, *Ichthyobodo* has been found to reproduce by binary fission i.e by simply dividing repeatedly (Southgate, 1993).

Another form of ectoparasite found on the skin was *Piscicola* sp. The low prevalence rate (1.6%) of the annelid could be due to the migratory act of leech which only derives its nourishment when the need arise using both its anterior and posterior suckers. This parasite was observed not to be host specific (Omoniyi and Olofintoye 2001). Both cestodes and nematodes (helminthes) recovered accounted for only 2.5% of infection in the fish, which is integral in the occurrence of helminth infection. This is contrary to the findings of Ibiwoye et al. (2006) who reported the prevalent rate of 22.5, 76.25 and 1.25% for nematodes, cestode and trematode in *Clarias anguillaris* in Onitsha area along River Niger.

In relation to size, the length range of 10.0 - 14.9 had highest incidence rate of 75%. This means that the post-juvenile/ pre-adult fish were more infested than the smaller and older ones. This observation corroborates the investigation of Adeyemo, (2001) on the incidence and pathogenesis of *Chrostomium tilapiae* in Oyo State farms and reported that juvenile fish were more susceptible to *C. tilapiae* infection. This is also in consonance with Akinsanya et al., (2007) who reported that the smaller fish were more infested than the bigger ones. In contrast, Kudoro (1995) studied some parasites of culture fish and reported that there was a gradual increase in the percentage infection with increase in length.

The differences in the prevalence of infection between males and female have been observed by previous workers (Omoniyi and Olofintoye, 2001; Chacha and Lamtane, 2014). The observation in this study seemed to be due to the more foraging habit of the males than the female, resulting in a higher exposure to infection.

5.0 CONCLUSION

From the present study and previous reports, parasites of fish are likely to be qualitatively similar in all Nigerian freshwater but the level of their prevalence tends to vary greatly. The parasitic infection recorded in the present study is important to the fishery in the area and requires to be checked as the infection rate was significant enough to elicit some pathological effects on fishes by retarding their growth, cause death and reduce their market value. Not only this, the potential of human population becoming infected by these parasites in the reservoir exists.

REFERENCES


INDUCTIVELY COUPLED PLASMA-ATOMIC EMISSION SPECTROPHOTOMETER (ICP-AES) DETERMINATION OF TRACE ELEMENTS PRESENT IN Telfairia Occidentalis and Vernonia Amygdalina OBTAINED FROM ORITA MARKET, ILARO TOWN, YEWA SOUTH LOCAL GOVERNMENT, OGUN STATE

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ABSTRACT

Samples of Telfairia occidentalis and Vernonia amygdalina were purchased at Orita market in Ilaro town, Ogun state. These vegetables were analysed for the presence of the following trace elements Chromium, Copper, Iron, Selenium and Zinc. The inductively coupled plasma-atomic emission spectrophotometer (ICP-AES) was used to determine the trace element levels. The results revealed that T. occidentalis had levels of Cu, Fe and Zn to be 0.0235mg/kg, 0.9914mg/kg and 0.1077mg/kg respectively while V. amygdalina had levels of Cu, Fe and Zn to be 0.0375mg/kg, 0.5352mg/kg and 0.1916mg/kg respectively. Chromium and selenium were not detected in both vegetables. These results showed that the trace elements analysed for were all below the levels that could bring about toxic and unwanted effects. These results also revealed that of the two vegetables, T. occidentalis is a better source iron while V. amygdalina is a slightly better source of zinc and copper.

Keywords: Trace elements, Telfairia occidentalis, Vernonia amygdalina

1.0 INTRODUCTION

Vegetables are an important part of the diet. They are important in the prevention of cardiovascular diseases and certain cancers as well as reducing the risks of obesity and diabetes (Hoejskov, 2014). It is no news that leafy vegetables are abundant in vitamins, minerals and essential amino acids. Green leafy vegetables are an affordable and rich source of proteins as they can make amino acids from readily available source materials like water, carbon dioxide and nitrogen from the atmosphere (Fasuyi, 2006).

Vegetables are relatively cheap in South Western Nigeria because they are grown extensively and have always been a part of the diet. The cultivation and sale of vegetables are a huge source of income to a myriad of people such as the farmers, the sales people as well as the sellers and producers of fertilisers and pesticides (Dike &Odunze, 2016).

Industrialisation has increased environmental pollution, where water, air and the soil are being polluted by different toxic substances. Crops grown on contaminated soils, easily take up these toxic substances example of which are trace elements (Khan, Cao, Zheng, Huang & Zhu, 2015). Copper (Cu), Chromium (Cr), Iron (Fe), Zinc (Zn) and Selenium (Se) are examples of trace elements needed in small quantities for the normal functioning of both plant and animal cells. However, these elements can quickly accumulate to very dangerous and toxic levels due to contamination from anthropogenic activities and if present in foods like vegetables, they can bring about harmful effects to humans who consume them (Uwah, 2017). The concentration of trace elements in plants depend on the characteristics of the soil and how the plant can specifically bioaccumulate the elements (Divrikli, Horzum & Soylak, 2006). In addition, trace elements can also get into vegetables when farmers use contaminated water to wash them before taking them to the market.
With the advent of the education of people to reduce the consumption of processed foods and return to more natural foods such as vegetables, it is important to ensure that these vegetables are safe for consumption and do not cause more harm than good. It is therefore important to determine the levels of trace elements in vegetables in order to assess their safety for consumption. In view of this, this study aimed at using the Inductively Coupled Plasma Atomic Emission Spectrophotometer (ICP-AES) to determine the levels of trace elements present in two vegetables (Telfairia occidentalis and Vernonia amygdaline) available at the Orita market of Ilaro town, Yewa South Local Government, Ogun State.

2.0 MATERIALS AND METHODS

2.1 Plant material and collection: Vegetable samples (fluted pumpkin and Bitter leaf) were purchased from Orita market in Ilaro, Yewa South Local Government, Ogun State, Nigeria. The vegetables were cleaned with tap water and then de-ionised water to remove any dirt and impurities present. After rinsing, the vegetables were air-dried and then crushed using mortar and pestle. The powdered samples were then stored at room temperature in airtight polythene bags in preparation for the wet acid digestion.

2.2 Trace Element Determination: 1g of each sample was weighed and poured in a digestion flask while aqua regia (HNO₃ and HCl) in ratio 1:3 was added. The solution was subjected to heat until a clear solution was obtained. The clear solution was allowed to cool and then filtered into a 100ml standard flask, which was filled to mark with de-ionised water. All reagents were of analytical grades and all samples were run in triplicate using the inductively coupled plasma-absorption emission spectrophotometer (Agilent 710 ICP-AES).

The vegetable samples; Fluted pumpkin (Telfairia occidentalis) and Bitter leaf (Vernonia amygdaline) were analysed for the following trace elements; Copper, Iron, Chromium, Zinc and Selenium.

2.3 Data Analysis: Data produced from this research study was subjected to statistical tools of analysis using mean for the measurement of central tendency, and standard error of the mean for the measurement of the deviation of the sample mean from the population. In addition, a bar chart was also drawn to visually compare between the concentrations of the trace elements in the two vegetables.

3.0 RESULTS AND DISCUSSION

3.1 Results

The results from the analysis are presented in tables 1, 2 and figure 1.

<table>
<thead>
<tr>
<th>Elements</th>
<th>Telfairia occidentalis (mg/kg)</th>
<th>Vernonia amygdaline (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cr</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Cu</td>
<td>0.0235±0.0001</td>
<td>0.0375±0.0078</td>
</tr>
<tr>
<td>Fe</td>
<td>0.9914±0.5042</td>
<td>0.5352±0.0248</td>
</tr>
<tr>
<td>Mg</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Se</td>
<td>0.1077±0.0028</td>
<td>0.1916±0.0101</td>
</tr>
</tbody>
</table>

Values are in mean ± SEM. ND= Not detected.
Figure 1. Bar chart representation of the concentrations of trace elements in the two vegetables.

Table 2: WHO/FAO maximum tolerable levels for Cu, Fe and Zn. (WHO/FAO, 2011)

<table>
<thead>
<tr>
<th>Trace Element</th>
<th>PMTDI (mg/kgbw)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu</td>
<td>0.05-0.5</td>
</tr>
<tr>
<td>Fe</td>
<td>0.8</td>
</tr>
<tr>
<td>Zn</td>
<td>0.3-1</td>
</tr>
</tbody>
</table>


3.2 Discussion

The results in table 1 and figure 1 show the concentrations of Cu, Cr, Fe, Se and Zn in Fluted pumpkin (*Telferia occidentalis*) and Bitter leaf (*Vernonia amygdaline*) obtained from Orita market in Ilaro, Ogun state. The values are given as mean ± SEM and the results are means of duplicate values. The trace element levels were based on the dry weight of the vegetables. Table 2 shows the levels of essentiality and the maximum permissible limits of the trace elements as provided by WHO. For values with ranges as in Cu and Zn the lower limit values are the levels of essentiality while the upper limit values are the maximum permissible limits. Chromium and Selenium were not detected in any of the vegetables analysed. In both vegetables, Iron had the highest concentration while Copper had the lowest concentration. Between the two vegetables analysed, *Telferia occidentalis* popularly known as Ugwu, had almost double the amount of Fe found in Bitter leaf. However, Bitter leaf had higher concentrations of Zinc and Copper. The concentration of Cu in both vegetables was the least. In the order of decreasing concentration for both vegetables we have; Fe>Zn>Cu.

The presence of copper in proteins and enzymes has established its essentiality as an element (Goldhaber, 2003). It is important for the growth of connective tissue, bone and nerve covers. It is also involved in the metabolism of Iron and energy (Fraga, 2005). Excess intake of Cu is likely to bring about nausea, jaundice, diarrhoea, emesis, haemoglobinuria and/or haematuria, jaundice, oliguria/anuria, hypotension, coma and death (WHO, 2011). According to WHO, the fatal oral dose of Cu is 200mg/kg.

The results obtained in this study for *Telferia occidentalis* was lower than that of Oyekanmi, Farombi and Adebayo (2014) who reported values in the range of 0.2- 5.8 mg/kg from selected local governments in Osun...
state but was similar to that reported by Uka, Chukwuka and Afope (2013) who reported values in the range of 0.02-0.07mg/kg. The concentrations of Cu in the vegetables studied are well below both the level of essentiality and the maximum permissible limit as provided by WHO.

Iron is an important trace element to all living organisms. It is essential in the production of haem proteins, myoglobin, enzymes and is stored in the bone marrow, spleen and liver (Goldhaber, 2003; WHO, 2011). Iron is also important in the transportation of carbon dioxide and oxygen. Insufficient supply of iron to the human body can lead to anaemic events which can bring about weakness and a decrease in endurance during strenuous activities (Brewer, 2007). *T. occidentalis* has the higher Fe content among the two vegetables studied and will be a beneficial addition to the diet of anyone who has low iron or is anaemic. The values obtained for Fe in this study are below the maximum value provided by the WHO.

Zinc like other trace elements is crucial to the improvement and growth of living organisms. It is important in the reproductive systems of males and also in the proper functioning of nerves (Mohammad & Sharif, 2011). Inadequate intake of zinc can bring about disruptions in the functions of the immune system; affect the healing of injuries, the olfactory organs and taste buds as well as DNA production (Fraga, 2005). Chronic high level ingestion of zinc in humans has been implicated in poor copper intake while acute ingestion can cause stomach problems and vomiting (WHO, 2011). Ogbuji, Ndulaka and David-Chukwu (2016) in a study of widely consumed vegetables in the south-eastern part of Nigeria, reported values for *T. occidentalis* and *V. amygdaline* to be 0.175mg/kg and 0.132mg/kg. These values are slightly different from those obtained in this study which could be as a result of difference in soil composition or a anthropogenic activities going on in the regions.

4.0 CONCLUSION

This study analysed vegetables; *Telfairia occidentalis* and *Vernonia amygdaline* also known as fluted pumpkin (Or Ugwu) and bitter leaf for the trace elements- Chromium, copper, iron, selenium and zinc- obtained from Orita market, Ilaro, Ogun state. The results obtained in this study indicates that these vegetables are safe to eat because they contain safe levels of the trace elements determined as their concentrations were below the Provisional Maximum Tolerable Daily Intake as recommended by WHO.

REFERENCES


PROTECTIVE ROLE OF METHANOLIC EXTRACT OF GOMPHRENA CELOSIODES LEAVES ON ACIDIFIED ETHANOL-INDUCED GASTRIC ULCER IN MALE WISTAR RATS

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ABSTRACT
This study was designed to investigate the effect of the methanol extract of Gomphrena celosioides leaves on acidified ethanol-induced gastric ulcer in male Wistar rats. It examined the in vivo antioxidant effect and also the antiulcer potentials of Gomphrena celosioides leaves. Methanol extract of Gomphrena celosioides leaves was administered at 200, 400 and 800 mg/kg body weight by oral gavage and control group received 50mg/kg cimetidine. The treatment lasted for 14 days. In vivo antioxidant enzymatic activity, ulcer parameters and histological evaluation of gastric mucosa were assessed. Administration of acidified ethanol decreased the activities of antioxidant enzymes, superoxide dismutase (SOD) and glutathione peroxidase (GPx) in the untreated ulcerated group with an increase in the levels of malondialdehyde (MDA), and the activity of xanthine oxidase (XO). A decrease in the concentration of reduced glutathione (GSH) was observed in the untreated ulcerated group. However, post treatment with either the extract or cimetidine showed a concentration dependent increase in the activities of SOD, GPx, and the levels of GSH with concomitant decrease in levels of LPO and the activity of XO. The histopathology of the gastric mucosa from rats in the untreated ulcerated group showed sections of leucocyte infiltration and disruption in the epithelial layer, lamina propria, muscularis mucosa and muscular layer which was restored in ulcerated rats post treated with Gomphrena celosioides leaves. Our data indicate Gomphrena celosioides leaves has profound antiulcer properties and is able to protect the gastric mucosa from ethanol induced gastric lesions. The antiulcer properties of the plant might be mediated through its free radical scavenging activity.

Keywords: Ulcer, Antioxidant, Histopathology, Gastric mucosa.

1. INTRODUCTION
Peptic ulcer occurs in more than 10% of world population (Ishida et al., 2010). It is one of the most important ailments of gastrointestinal tract in the world and it becomes a global problem due to its increasing morbidity and mortality (Martins et al., 2014). Peptic ulcers are chronic and often single lesions that may occur in any part of the digestive tract (Kumar et al., 2017).

The signs and symptoms of peptic ulcer can be constant or sporadic, and the disease cause varies among individuals (Traversa et al., 1995). The most common symptoms of peptic ulcer are known collectively as dyspepsia. Dyspepsia may be persistent or recurrent and can lead to a variety of upper abdominal symptoms such as pain, vomiting blood or vomit with the appearance of coffee grounds, black or tar-like stools, unintended and unexplained weight loss weight loss and anemia.

Oxidative stress has been implicated as the major cause of stress ulcers. Evidence supports that psychological stress, in addition to physical stress such as surgical intervention and microbial infection including Helicobacter pylori (H. pylori) (Ishida et al., 2010), leads to oxidative stress in the stomach. Oxidative stress, which is a state of elevated levels of reactive oxygen species (ROS), causes a variety of conditions that stimulate either additional ROS production or a decline in antioxidant defenses. Gastric mucosa is exposed to gastric acid, pepsin, and stimulants among others, while gastroprotective factors maintain the integrity of the gastric mucous layer, microcirculatory system, HCO$_3$-, prostaglandins (PGs), epidermal growth factor synthesis, and epithelial cell restitution. Imbalance between the aggressive factors and mucosal defense system envelops the multifactorial process that underlines the disease (Pan et al., 2008). Besides stress, factors that may increase the incidence of peptic ulcer disease (PUD) include alcohol consumption, smoking, H. pylori, and the use of nonsteroidal anti-inflammatory drugs (NSAIDs) (Vonkeman et al., 2007).

The use of drugs such as antibiotics, proton pump inhibitors (omeprazole), prostaglandin analogs, and H2 receptor blockers (cimetidine, ranitidine, and famotidine) have been reported to reduce the mortality of stomach
ulcers. However, discovery of new therapeutics for the treatment of this disease is necessary (Massignani et al., 2009).

Studies show that numerous natural products including herbs and spices have biological properties alongside gastric ulcer prevention potential (Repetto and Llesuy, 2002). A large number of medicinal plants with gastric antiulcer potential have been reported (Abdulla et al., 2010; Mahmood et al., 2010; Wasman et al., 2010).

*Gomphrena celosioides* also known as Soft Khaki weed is a shortlived perennial plant that belongs to the Amaranthaceae family (Allison et al., 1992). *Gomphrena* species in different parts of the world are used for various folkloric medicinal purposes (Viera et al., 1994). Earlier research work by Botha and Gerritsma-Van der Vijver (Botha et al., 1986) on GC extracts revealed the presence of saponins, steroids, amino acids, nonreducing sugars, phenols, and flavonoids (Viera et al., 1994).

This study was undertaken to evaluate the gastroprotective effects of methanolic extracts of this plant against HCl/ethanol-induced gastric ulcer in rats.

## 2. METHODS AND MATERIALS

1-chloro-2,4-dinitrobenzene, 5,5-dithiobis-(2-nitrobenzoic acid), xanthine, xylenol orange, sulphosalicylic acid, sorbitol, hydrogen peroxide, reduced glutathione, epinephrine, sodium azide, ammonium ferrous sulphate, sodium acetate, potassium sodium tartrate, Tris base, acacia powder (Sigma Aldrich, England); methanol, hydrochloric acid, potassium chloride (BDH, England); tricarboxylic acid, ethanol, diethyl ether (Park, United Kingdom); The chemicals used for this study were all obtained from recognized outlets and were of analytical grade. Cimetidine was obtained from a recognized pharmacy and was prepared freshly before use.

*Gomphrena celosioides* leaves were obtained from Iwo, Osun state and air dried for a week until it was fully dried. The leaves were blended and then 800g soaked in 6litres of methanol for 72hours after which it was filtered and the filtrate was evaporated using rotary evaporator. The extract was allowed to dry completely before it was administered to the animals.

### 2.1 Experimental Animals

Male Wistar rats weighing 140-160g were obtained from the department of Veterinary Anatomy, University Of Ibadan, Ibadan and kept in an animal house for 2weeks to acclimatize. Rats were randomly divided into eight groups with five rats within each group. They were fed on a standard rat diet and tap water. The rats were fasted for 24hours but allowed free access to water prior to the oral induction of gastric ulcer.

### 2.2 Experimental Design

Gastric ulcer was induced by the administration of acidified ethanol (0.15N HCl + 70% v/v absolute ethanol). The animal grouping is shown thus;

**Group 1** (normal control): 1ml of 1% gum acacia

**Group 2** (ulcer control): 0.5ml of acidified ethanol (0.15N HCl + 70% v/v ethanol)

**Group 3**: 0.5ml of acidified ethanol + 200mg/kg body weight of the Methanol extract of *Gomphrena celosioides* leaves

**Group 4**: 0.5ml of acidified ethanol + 400mg/kg body weight of the Methanol extract of *Gomphrena celosioides* leaves

**Group 5**: 0.5ml of acidified ethanol + 800mg/kg body weight of the Methanol extract of *Gomphrena celosioides* leaves

**Group 6**: 0.5ml of acidified ethanol + 50mg/kg body weight of cimetidine

**Group 7**: 50mg/kg body weight of cimetidine alone

**Group 8**: 400mg/kg body weight of Methanol extract of *Gomphrena celosioides* leaves alone
2.3 Methods

The formation of ulcers and the ulcer lesions were scored according to the methods by Ohara et al., 1995. Gross mucosal lesions were recognized as hemorrhage or linear breaks (erosions) with damage to the mucosal surface. The gastric mucus content of each stomach was determined according to the method by Ueda et al., 1992. Protein concentration in the supernatant of the stomach homogenate was determined according to the method of Lowry et al., 1951. The levels of SOD activity was determined by the method of Misra and Fridovich 1972. The method of Beutler et al., 1963 was followed in estimating the level of reduced glutathione (GSH). Lipid peroxidation was determined by measuring the levels of malondialdehyde produced during lipid peroxidation according to the method described by (Varshney and Kale 1990). Glutathione peroxidase (GPx) activity was determined by the method of Rotruck et al 1973 with some modifications, which is based on the reaction between glutathione remaining after the action of GPx. Xanthine oxidase activity was determined by the method of (Prajda and Weber 1975).

2.4 Histopathological Assessment

Stomachs from rats of all groups were fixed in 10% formaldehyde, dehydrated in grade alcohol and embedded in paraffin. Fine sections were obtained, molded on glass slides and stained with hematoxylin-eosin (H&E) for light microscope observations.

3. RESULTS AND DISCUSSION

3.1 Results

Table 1: Effect of methanol extract of *gomphrena celosioides* leaves on ulcer parameters in HCl/EtOH induced gastric ulcer healing in male rats.

<table>
<thead>
<tr>
<th>PARAMETERS/GROUP</th>
<th>Gastric Volume(ml/4h)</th>
<th>Acid Output(μEq/4h)</th>
<th>Mucus content (μg/gm tissue)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>2.36 ± 0.23b</td>
<td>40.03±0.06b</td>
<td>212.96±5.13b</td>
</tr>
<tr>
<td>HCl/EtOH alone</td>
<td>3.24 ± 0.22a</td>
<td>80.38±1.18a</td>
<td>58.48±1.22a</td>
</tr>
<tr>
<td>200mg/kg GC + HCl/EtOH</td>
<td>2.59 ± 0.16b</td>
<td>60.02±1.00ab</td>
<td>90.51±0.30ab</td>
</tr>
<tr>
<td>400mg/kg GC+ HCl/EtOH</td>
<td>2.41 ± 0.45b</td>
<td>50.10±0.88b</td>
<td>87.97±4.87ab</td>
</tr>
<tr>
<td>800mg/kg GC + HCl/EtOH</td>
<td>2.11 ± 0.44b</td>
<td>50.07±0.93ab</td>
<td>127.45±4.14ab</td>
</tr>
<tr>
<td>50mg/kg cimetidine+ HCl/EtOH</td>
<td>2.23 ± 0.19b</td>
<td>40.75±0.35b</td>
<td>92.62±2.69ab</td>
</tr>
<tr>
<td>50mg/kg cimetidine alone</td>
<td>2.41 ± 0.67b</td>
<td>50.25±0.35b</td>
<td>167.79±4.14ab</td>
</tr>
<tr>
<td>400mg/kg GC alone</td>
<td>2.48 ± 0.24b</td>
<td>50.45±0.07b</td>
<td>135.38±5.11ab</td>
</tr>
</tbody>
</table>
Table 2: Effect of methanol extract of *gomphrena celosioides* leaves on ulcer parameters in HCl/EtOH induced gastric ulcer healing in male rats.

<table>
<thead>
<tr>
<th>PARAMETERS/GROUP</th>
<th>Ulcer score</th>
<th>Ulcer index</th>
<th>% Inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HCl/EtOH alone</td>
<td>13.25 ± 2.99&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.31 ± 0.75&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>200mg/kg GC + HCl/EtOH</td>
<td>10.80 ± 2.59</td>
<td>2.16 ± 0.48</td>
<td>34.79%</td>
</tr>
<tr>
<td>400mg/kg GC + HCl/EtOH</td>
<td>8.00 ± 3.37</td>
<td>2.00 ± 0.84</td>
<td>39.63%</td>
</tr>
<tr>
<td>800mg/kg GC + HCl/EtOH</td>
<td>7.40 ± 1.82&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.53 ± 0.36</td>
<td>53.81%</td>
</tr>
<tr>
<td>50mg/kg cimetidine + HCl/EtOH</td>
<td>5.50 ± 1.29&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.37 ± 0.16</td>
<td>58.49%</td>
</tr>
<tr>
<td>50mg/kg cimetidine alone</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>400mg/kg GC alone</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Figure 1: Effect of methanol extract of *gomphrena celosioides* leaves on antioxidant enzymes in HCl/EtOH induced gastric ulcer healing in male rats.
Figure 2: Effect of methanol extract of *gomphrena celosioides* leaves on antioxidant parameters in HCl/EtOH induced gastric ulcer healing in male rats.

Values are expressed as mean ± SD of five rats

a significantly different from control group at p<0.05

b significantly different from HCl/EtOH group at p<0.05

Figure 3: Showing histological slides of the stomach tissue.

A: Control group showing normal histological structure of the epithelial layer, lamina propria, muscularis mucosa, submucosa layer and muscular layer.

B: Rats in the untreated ulcerated group showed sections of leucocyte infiltration and disruption in the epithelial layer, lamina propria, muscularis mucosa and muscular layer.
C: Stomach sections from ulcerated rats post treated with 200mg/kg body weight of *Gomphrena celosioides* leaves showed mild restoration of the epithelial layer, lamina propria and submucosa layer.

D: Stomach sections from ulcerated rats post treated with 400mg/kg body weight of *Gomphrena celosioides* leaves showed better restoration of the epithelial layer, lamina propria and submucosa layer when compared to those post treated with 200mg/kg body weight of the extract.

E: Stomach of rats post treated with 800mg/kg extract showed almost complete restoration of the epithelial layer, lamina propria, muscularis mucosa, submucosa and muscular propria.

F: Rats post treated with 50mg/kg of the reference drug show almost complete restoration of the epithelial layer.

G: Stomach sessions of rats treated with 50mg/kg of the reference drug alone showed no disruption in the epithelial layer, lamina propria and muscularis mucosa.

H: Rats treated with the extract alone showed no disruption in the epithelial layer, lamina propria, muscularis mucosa and submucosa layer.

3.2 Discussion of Result

Gastric ulcer disease is a multi-factorial disease (Khanna *et al*., 2006) and the significant role played by reactive oxygen species and free radicals during its pathogenesis is well experimented in both human and experimental rats (Rao *et al*., 2000).

Some studies have reported that oxygen generated free radicals and lipid peroxidation may play important roles in the pathogenesis of ethanol-induced gastric lesions (Kvietys *et al*., 1990). Ethanol induces a rapid and strong vasoconstriction accompanied by rapid and vigorous arteriolar dilatation. The oxyradicals generated during the ischemia-reperfusion provoke severe changes at the cellular level leading to death (Glavin and Szabo, 1992).

Acidified ethanol as used in this study is a model of mucosal barrier injury (Toker *et al*., 2013). It has been confirmed that exposing gastric mucosa to oxidative stress induced by ethanol administration (Hirokawa *et al*., 1998) leads to the generation of lipid peroxides as expressed by an increase in the gastric tissue level of malondialdehyde (MDA) accompanied by an impairment of oxidative defense mechanisms such as a reduction in superoxide dismutase (SOD), glutathione transferase (GST) and glutathione peroxidase (GPx) activities (Toker *et al*., 2013).

The efficacies of *Gomphrena celosioides* are often associated with their ability to scavenge stable free radicals (Zheng and Wang, 2001). *Celosioides* extracts have been shown to exhibit potent invitro antioxidant activity in determination of polyphenols, reducing power and lipid peroxidation inhibition in comparison to the known antioxidants, such as vitamin C. Polyphenols have also been shown to be the major plant compounds in the free radical scavenging and antioxidant activity (Maxime *et al*., 2012).

In this study, exposure of the animals to acidified ethanol may have caused severe ulcerogenic effect as ethanol is known to cause corrosion of the gastric mucosal cells resulting in their disruption and disintegration (Brossine, 1979). However, gastric protection was observed by 200, 400 and 800mg/kg dosage of the extract in ethanol induced gastric ulcers. The gastroprotective effect of the plant seems to be related to the reduction in the damage to the mucosa induced by free radicals and this activity may be due to its antioxidant action (Panda and Sonkamble, 2012).

Results from this study indicate that ethanol administration significantly reduced (P<0.05) the activities of SOD and GPx when compared with the normal control rats. A decrease in SOD and GPx activities in the gastric mucosa of rats exposed to acidified ethanol leads to the accumulation of reactive oxygen species and consequently to an increase in LPO level and hence, an increased mucosal damage (Vandana and Madhav, 2012). These observations confirmed the findings of several studies which reported alterations in antioxidant enzyme activities in ethanol exposed animals (Ellman, 1959; Sun and Zigman, 1978; Clairborne, 1985; Rotruck *et al*., 1973; Mohandas *et al*., 1984).

The dose related inhibition of acidified ethanol-induced decrease in activity levels of SOD, GSH and GPx when the animals were treated with *Gomphrena celosioides* leaves indicate that the plant contains bioactive substances which can stimulate the activity of the endogenous gastric antioxidant enzyme system (Maitiya and Chattopadhyay, 2008). The induced activity of the antioxidant defense system was supported by a decrease in
malondialdehyde level (LPO). This is supported by the research of many scientists including (Rony et al., 2011 and Meite et al., 2014). The effect of the reference drug and plant extract alone was also studied and it was observed that although the results were significantly different from the untreated ulcerated group, they were almost the same with the normal control group. Overall, the present study demonstrates the protective role of the methanol extract of *Gomphrena celosioides* leaves which can be attributed to the phytochemicals present in the leaves as reported by (Onocha et al., 2005).

4. CONCLUSION
From this study, it was observed that the ethanol induced gastric lesions in male Wistar rat was mitigated by *Gomphrena celosioides* leaves. The antiulcer properties of the plant might be mediated through its free radical scavenging activity. As observed in this study, all doses of the extract showed healing properties in the experimental animals. These findings suggest the potential therapeutic use of *Gomphrena celosioides* leaves as an effective non-toxic cure for ulcer as it is able to restore the antioxidant state of the gastrointestinal tract.

REFERENCES


INFORMATION RE-ENGINEERING METHODOLOGIES FOR ECONOMIC GROWTH AND SUSTAINABLE DEVELOPMENT

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ABSTRACT
For several decades, technology engagement in various sectors of the economy has been on the increase and information engineering (IE) is centered on development of information systems (IS). Re-engineering incorporate new computational approach to generate, distribute, process and use information. IS as decision support tools are computer-based infrastructures, which collect, process, store/manage and act on information. Information resource, a critical ingredient for socio-economic development required re-engineering methodologies to combat the menace of humanitarian crises. Though, TVET objectives of sustainable development centered on poverty reduction, production improvement, safety and good health, imminent challenges of hazards, local disasters, life-threatening conflicts had increased peoples’ vulnerability to humanitarian crises. This paper adopts Trajectory Range Query (TRQ) and k Nearest Neighbour (TkNN) algorithms (SpatialHadoop) for analysis and inferencing and the computation implemented shortest routes to query safety points in shortest intervals. Capacity building in ICT technologies via TVET strategy help unlocks greater potentials for greater services when objectively collaborated with STEM agenda. Engaging more women in information re-engineering reduces gender-imbalance problems. Increased women participation in IRE fosters more wisdom-driven analysis/inferencing, which significantly effect rapid talent-growth and skill-boost projections of TVET. Spatial operation and query analysis algorithms are useful for transportation and advance pattern-mining computations. They decisively provide solutions in crises’ handling. More women in STEM-related disciplines as information re-engineering is a focus to revamp TVET objectives and achievable goal of gender-balance is also an indicator of socio-economic growth and development.

KEYWORD: deep-learning, hadoop, kNN, trajectory, TVET

1 INTRODUCTION

Information re-engineering (IRE) computational paradigm consists of data-oriented analysis and process-oriented techniques for design, development and maintenance of information systems (IS) to support strategic decision-making processes and missions of any nation. Information engineering (IE) is specifically concerned with the application of science and technology in the development of qualitative information systems, offered as computer-based solutions and implemented as decision support systems (DSS) and tools engaged in the management of humanitarian crises globally. Objectives of IE include an ability to design, develop and maintain IS to support strategic decision processes.

IE methodologies encapsulate information acquisition, processing, inferencing, analysis and storage as corroborated in Sadiku, Shadare and Musa, (2017) but Information technology is characterized with efficient knowledge-driven computations, well-articulated with programming, analysis, management etc. techniques and skills that incorporate content-centric and wisdom-driven engagements (Bonnaud et al, 2010). Building on existing IT infrastructure, information re-engineering is considered to apply in the formulation of IT-based security-related solutions, which will add value to nation’s socio-economic growth and development.

Generally, SDGs centered globally on improving socio-economic status of the society through various means of poverty reduction (through various inclusions of health, finance, education etc. to address imminent disasters); hunger suppression (through improved production strategies of many agricultural products, drought monitoring and online pricing regulations via economic-dependent consumer price indexes); good health and well-being attainment (through literacy penetration and various unemployment reduction strategies) among others. Nations’ GDP grows with poverty reduction, improved production, human (service) mobility, industries, affordable energy, decent work provision, clean water supplies and quality education among others (Ojokoh, 2019).
Humanitarian crises are great sabotage to economic growth, more so as the general aftermath effects hinders developments in all ramifications. Societies continuously battered with various forms of crises are characterized with retrogressing economy and poor gross domestic product (GDP) as witnessed in most developing nations. GDP monetarily measures the market value of finished goods (materials or products) and services (skilled or trained) produced annually. Downward GDP steadily characterize crises periods if not properly controlled. Engaging information engineering technologies (such as cloud computing, machine learning, deep learning etc.) to create specialized IT applications in decision support services to mitigate various crises becomes a necessity.

Specifically, larger percentage of Nigerians are most vulnerable. Her hardest-to-reach people are impacted by various crises including the challenges of poverty, well-being hazards, health disasters and other life-threatening conflicts. Peoples’ vulnerability to humanitarian crisis (such as insurgency, Boko Haram, Fulani herdsmen attacks, pipeline vandalism, terrorist attacks, kidnapping, ritual killings, robbery, ignorance, illiteracy penetration among others) are visibly imminent. To address these and many other problems, some approach to increase resilience is conceived and this paper adopts information re-engineering technologies to complement IT-approaches to mitigate humanitarian crises and other DSS-based missions.

Also, Technical and Vocational Education and Training (TVET) in Nigeria is faced by many challenges, including gender inequality and inadequate capacity. Majority of students who enroll in TVET programmes are males, with less than 40% being female. Also, TVET institutions fail to teach skills and knowledge fit for the present and future labour markets because of inadequate ICT infrastructures (tools, skill/capacity etc) to deliver (TVETA, 2018). It is on these premises that the idea of improving IT capacity is conceived in this paper, as a strategy to deliver and impact socio-economic development.

2 RELATED WORKS

Technical and vocational education is a continental strategy to address the challenges of education and technical and vocational training to support economic development, create wealth and reduce poverty. Discussions related to this study includes TVET, STEM and IE model.

2.1 Technical and Vocational Education and Training (TVET) strategy
TVET is a form of education for those who need it, those who want it, and those who want to progress by it. As a result-oriented form of education, Okoye and Chijioke (2013) advocates that it is the development of the head (knowledge), training of the hand (dexterity) and enrichment of the heart (conscientiousness and painstaking). TVET is also a total deviation from previous emphasis of 3Rs (reading, writing and arithmetic) to 3Hs (head, hand and heart). In line with this vision, TVET strategies of aggressive capacity building is workable with technology adaptations to transform national production, industrialize the economy and keep abreast of developing and emerging technologies to impact society the more.

Though, TVET continental strategy is an action guide qualification and certification on skill, intelligence, knowledge, experience, competence, talent and special abilities (TVET, 2019), TVET’s offer of formal, non-formal and informal learning for social equity, inclusion and sustainable development incorporates creativity. These objectives contribute immensely to technological development required to formulate solutions needed in addressing humanitarian crises. Such capacity development and portability of TVET qualifications within national borders is a conviction of IT-solution for economic development.

2.2 TVET Challenges
Reported in UNESCO (2018), TVET in Nigeria is characterized with many challenges including:
(i) Gender inequality, which has been a long-term problem. Female enrolment in TVET programmes are considerably poor in STEM-related disciplines;
(ii) Inadequate infrastructure constraint. Inadequate and obsolete infrastructures (lecture rooms models, delivery styles, laboratories and workshops);
(iii) Financing, relating to insufficient budgetary allocation, which make most TVET institutions to be unsustainable;
(iv) Poor capacity development and inadequate provision for teacher training. Corresponding qualifications, knowledge and skill are grossly absent to fit into the present and future labour markets; and
(v) Inadequate ICT facilities to integrate e-learning, which makes it hard to improve the quality of teaching and learning outcomes.
2.3 Science, Technology, Engineering and Management (STEM)

STEM objectively integrates four disciplines (science, technology, engineering and mathematics) into a cohesive learning paradigm based on real-world applications (Okafor, 2012). STEM campaign addressed the inadequate number of teachers skilled to educate students and learners in the subjects (Hom, 2014). A skilled workforce is basically required for driving industrial and socio-economic growth of nations and TVET holds the key to building technical and entrepreneurial workforce. TVET as one major priority of Government’s development agenda, established under TVET Act, regulates and coordinates training, accredits programmes, institutions and trainers (TVETA, 2018).

2.3 Features of information engineering (IE)

IRE integrate tools, techniques and methodologies to develop IS solutions applicable for handling humanitarian crises. IE system model presented in Sadiku et al. (2017) is characterized with common data (mobile phone records) which is consistent in meaning and structured. Such information are applicable for IRE as are characterized with operational components required for decision support services. Major characteristics among others includes:

(i) information sharing, facilitated through common data infrastructure, useful for operational and decision-support purposes, which are central to any IS;
(ii) multi-dimensional systems that uses various hardware and communication facilities to provide operational support for re-engineering;
(iii) connectivity techniques with capability to communicate with people and other machines (computers);
(iv) artificial intelligent support that enables complex rule-base systems, machine learning and deep-learning approaches capture expert knowledge; and
(v) computer aided software engineering (CASE) tools, selected to automate IS development steps.

Information engineering model adopted from Sadiku et al. (2017) is modified and presented in fig.1 to show the various concepts and their relationships. Handling humanitarian crisis is a major determinant for economy growth and development because societal well-being is anchored on safety and security of lives and properties in the real world.

![Diagram](image_url)

**Fig. 1 Conceptual information re-engineering model**
(adapted and modified from Sadiku et al., 2017)

3 METHODOLOGY

Adopting the heterogeneous multiple platform defined and developed in Jiamin and Ralf (2012); Sijie et al.(2018) deployed the MapReduce analysis to implement trajectory operations built on-top of Hadoop platform as similarly implemented in Uber (2019). Given query predicate on query point \( P(x,y) \) and time interval \([t_1, t_2]\), the three-dimensional query predicate finds all trajectories overlapping with defined query region (using RangeQuery) within specified space and time.
With language, finding all routes entering RUGIPO campus between January and June 2018 implemented as object, trajectories captured ordered sets of intermediate states was assumed for moving pedestrian (student/staff) as dynamical systems. Temporal slicing mechanism was used to break the trajectories into subsequences. With general view to capture pedestrians including passengers waiting endlessly on the highways, wandering Fulani Herdsmen, commuters, loiters etc., some routes were deliberately avoided as spaces or coordinates not connected. Tracks, lanes, paths are lines and points marked as a result of time and evolution of crisis defined. Information acquisition by sensors was effected on various routes as applicable in real world.

On the generic (open source Hadoop) distributed processing framework, Trajectory Range Query (TRQ) algorithm was implemented in three steps to achieve temporal filtering, spatial searching and spatio-temporal refinement. Cleaning the dataset of similar trajectories, obtained from defined ranges were carried out to remove duplicates. Libraries provided within framework implemented the analysis for duplicates’ removal. Trajectories were replicated between partitions as the queries run several times. This is re-engineering approach.

Then, inferencing was implemented on Hadoop layer components – indexing spatial-based file data; operations of RangeQuery, ST-Join, kNN, similarity; and language of time-interval, MapReduce tasks were implemented. Spatio-temporal information was analyzed as set of spatio-temporal points, path as lines and spaces as coordinates not connected (Hadoop, 2019).

Fig. 2 shows the code snippet of TRQ for loading and querying trajectories to compute similarity between the data records in ST-Hadoop.

```plaintext
Objects = LOAD 'point' AS (id:int, STPoint);
Intermediate = FILTER Objects BY
OVeleps ((Rectangle (x1, y1, x2, y2)),
   Interval (t1, t2);
GROUP Object BY (id)
FOREACH $Object(id) Search Trajectory(id)
Result = SIMILAR Object threshold:7 From Intermediate
```

TRQ query finds similar objects within defined rectangular area represented by two corner points \((x_1, y_1; x_2, y_2)\) at defined time intervals. The objects were loaded as trajectories spatio-temporal points and ST-Hadoop finds all records overlapping with the defined time interval. Retrieved records were grouped and trajectory_ID of entire trajectory sequence retrieved from secondary inverted index. Similarity between data records was evaluated and finding nearest point to query point during defined time interval was accurately computed.

Distributed spatial systems are extensions of MapReduce platform, dedicated for spatial analysis. Other versions including SpatialHadoop, ScalaGiST, Hadoop GIS and Summit are applicable for analyzing trajectory data.

3.1 AI Deep Learning Methodologies

Computational approach of AI deep learning was used on a local (campus) map section as input with focus on pedestrians as dynamical objects of trajectories in time of crises. Objects captured by sensors were viewed as array of pixels enable randomization, and numerical numbers between 0 and infinitely large integers were assigned. Approach used in the methodologies include initialization (randomization or Gaussian distribution) at input layer, sampling (pooling) and Batch normalization (as batch models) created at hidden (operation) layers and output regularization called dropouts measured at output (language) layer in resonance with methodology defined in Data Turks (2018). Uber (2019) implemented Hadoop as backbone for storing data as non-indexed heap files, so adopting the ST-Hadoop framework defined in Louai et al. (2018) enable computed inferences to be feasible and validated for use as DSS for formulated technologies.

4 RESULTS AND DISCUSSION

Re-engineering techniques, analysis and inferencing computational technique defined in ST-Hadoop IRE model is suitable for accurate prediction performance and MapReduce tasks for many applications relating to intelligent transportation system and advance pattern mining queries. Similarity query algorithm shown in fig. 2 would help predict movement of pedestrian (student/staff) in time of crises. The result output (actuators) are
efficient DSS tools, jointly used with other computational technologies (formulated ICT-solutions) is very suitable in the handling of humanitarian crises. Predictions obtained from massive data management techniques evolve to support sophisticated technical infrastructures based on skill and capacities. Formulated technologies (ICT-solutions) applicable in humanitarian crises includes:

- connectivity through BGAN: Broadband Global Area Network (BGAN) devices can offer satellite connectivity in remote humanitarian crisis zone. It enables topology options using portable terminals, easily connectible to laptops for broadband Internet;
- distributed geospatial systems: Tools (HadoopGist, Scala-Gist available as generic (open source) platforms for spatial analytics and the extended Resilient Distributed Dataset (RDD), can support spatial operations to access and provide real-time, inexpensive satellite imagery for accurate geospatial maps of affected areas to support decisions;
- call data record (CDR) modeling: Peoples’ locations can be tracked in emergencies using radio tower locations and ubiquitous mobile phones. Location and movement (travel/walking) habit can be modeled through CDR to assist in relocation, settlement or easy distribution of relief materials;
- power or energy solution: provision of alternative energy (affordable solar power) solution setup, maintainable in conflict zones and situations. (This also provide ability to recharge mobile phones, power life-saving device or give lights in rural areas);
- logistics: DSS tools offers timely (logistic) intervention in getting resources to affected locations. Employed by relief agencies for community resilience in time of crises, practitioners with logistic capacity can deploy this IS with other solutions to adapt consequences of catastrophic failures (such as solar-power power outages, fire extinguisher, bomb-detectors etc.);
- offline services and big data: using resource (such as AWS Snowball Edge, which is petabyte-scale data transport) with computer tool, 100 Terabyte (100TB) of data is transferrable and on-board storage plus temporary local cloud computing capabilities provided;
- digital identity: this technology offers many solutions to include easy identification of citizens and determination of services entitled. Documentation will also enable quick replacement if lost in crises period and storage enhanced by block-chain technology (data shared with others for safety and retrieval); and
- financial service inclusion: using the ubiquity of mobile phones, payments made in digital forms reduces stress and other challenges of theft or robberies. This is useful and could be aided by digital identity.

4.1 Evaluating IRE approach and AI methods

IRE constitutes information application for a variety of tasks and its methodologies evolves solutions that addresses many concerns affecting the society because Artificial Intelligence (AI) deals with helping machines find solutions to complex problems in a more human-like fashion. Information sourcing, retrieving and exploitation are increasingly offered to proffer solutions to real-life problems. As stated in the MDG, by 2030, legal identity must be provided for all. Nigeria as one of the nations is presently characterized with many humanitarian crises, far more reaching and becoming widespread in all states. Capacity building through STEM and TVET adoption should focus on both information-oriented analysis and process-oriented techniques for providing solutions, which can promote the economy. IRE and AI methods evolve socio-economic development when adequately harnessed.

Analysis in IE is data-oriented (Demurjian, 2008) approach and query mining inferencing is (AI) process-oriented. The duo is implemented in IRE and the methodologies are employed to develop user specified solutions as corroborated in Sadiku et al. (2017). IRE is vital as critical systems (such as health-care, aircraft control, telecommunications, ATM/banking, biotechnology, CAD/CAM, geographical information systems (GIS) and reservations) heavily depend on information to deliver. Therefore, women participation in these areas and many more STEM-related disciplines is a targeted approach towards gender-equality, which is a candid profitability factor for improved economy and strategized SDG-goal attainment.
4.2 Technology option justification for humanitarian crises

Technology approaches in both slow and fast crisis must focus on tools that impacted society. Responders should know how to apply them and focus would be on quick response rather than random experimentation. With women participation in IRE as men, greater productivity is realizable and gender-equality goal is attained. Though, gender is perceived as major factor of performance at different levels of academic pursuit, and studies conducted in Salikutluk and Heyne (2017) align masculine characteristics to science professionals and feminine to humanities, gender-balance will prove these assertions otherwise with TVET strategy and adequately harnessed IRE methodologies. Equally, as gender-equality does not connotes rivalry but complementation, the more women in large/massive data handling characterized in deep-learning AI techniques, the more TVETs’ objectives would impact socio-economic growth. Formulated technologies in this paper will help mitigate humanitarian crisis and increase community resilience if implemented by a strong association of men and women.

5 CONCLUSIONS

IRE methodologies are employed to develop ICT-technologies, which could serve as DSS tools to assist in handling humanitarian crises. Objective of using TRQ and TkNN algorithms in finding k nearest trajectories similar to defined ranges based on RangeQuery was achieved. Analysis and inferencing of given queries are very useful in many applications such as intelligent transportation systems (ITS) and advance pattern-mining queries. These approaches enable further information-related activities as sourcing, retrieval and exploitation using procedures of partitioning, local-computation and global-computations.

It is quickly suggested in line with Aderibigbe (2011) that, since TVET play key roles in human development and capacity building, its strategies should be targeted to avert gender-inequality and capacity- inadequacy problems associated with ICT and other disciplines. This is because, ICT is regarded as the wheel of development in developing nations. Therefore, more women impact in ICT, which had witnessed the birth of organizations like Women in Artificial Intelligence (WAI), Women in Machine Learning (WiML), Nigerian Women in Information Technology (NIWIIT) and several others, the general view of male students outperforming the females in STEM-related disciplines had been proved otherwise and encouragement of more women participating in STEM-related disciplines (through TVET strategies) will positively achieve the SDG goal of gender-equality. Women will be given more boost through collaboration with men to build more capacity, which is another feat that will rapidly enhance socio-economic growth and development.

It is also worth mentioning here that women (including girl child) should be mandated to participate in STEM-related disciplines. ‘BEMORE’, an initiative of the first lady of Ondo State, Her Excellency, Mrs. Betty Anyanwu-Akeredolu, was initiated to train secondary school girls on science tech, ICT development and other entrepreneurial skills. After a boot camp, formidable organizations volunteered partnership and girls trained to design renewable energy systems and deploy IT solutions, which added value to the State’s economy. The laudable project among her other numerous projects had empowered majority of the secondary school girls in Ondo State.

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ABSTRACT

The study examined the choice of career in journalism among female mass communication students of the federal polytechnic, Ilaro. Survey research method was used with questionnaire as the instrument of data collection. 120 questions were administered and 108 were retrieved fully. Data was analyzed using SPSS (622). Cognitive theory was used for the framework. The study found out that majority of female mass communication students of the federal polytechnic, Ilaro do not have the intentions of making a career in journalism after graduation. Findings, also showed that female students of mass communication are discouraged from practicing journalism due to gender discrimination, religious and cultural beliefs as well as marital status. The study recommends that institutions offering mass communication encourage more female mass communication students to practice journalism as a profession after graduation. Gender discrimination towards female journalists should be abolished, while husbands should also encourage and support their wives who are graduates of mass communication in taking up journalism as a career.

Keywords: Career, Journalism, Mass Communication, Female, Marriage, Religion

1. INTRODUCTION

Journalism, arguably is a profession that is most widely sought after across the world. While it has been discovered also that most female prefer studying journalism as a course, the same cannot be said of them making career in the profession after graduation. Apuke (2016) cited in Patricia, Samuel, Celuwa, Fisayo, Ifeoluwa & Omolayo (2015) states that since the inception of journalism as an area of specialization in mass communication studies among Nigerian universities in the 1960s, enrollments have been largely populated by female students. However, further studies have equally revealed that only very few female students usually venture into the practice of journalism after graduation.

Journalism is the collection, preparation and distribution of news, related commentary and feature materials through the media such as pamphlets, newsletters, magazines, radio, television, billboards, internet and books. Journalism as a profession is an essential part of the society. Apart from news and information dissemination, it involves going extra miles in getting news worthy information by way of investigative and interpretative journalism in order to bring out hidden facts and information through the media to the people (Ali, 2010). Okoro and Chiweobo – Onuoha (2013) define journalism as a veritable tool for information dissemination, social mobilization and control. A means of educating the society and sensitizing them on very important issues affecting the lives of the people.

Historically, journalism as a course of study started in Nigeria in the early 1960s, with only two Federal Universities offering courses in journalism. While University of Nigeria, Nsukka started in 1961, the University of Lagos, commercial these programmes in 1967 with the introduction of Diploma in Mass Communication which allowed students to take courses in journalism (Wikipedia.org). Presently, almost all higher institutions
of learning in Nigeria offer mass communication courses leading to the award of various degrees and certificates and well as diplomas at National and Higher levels up to Bachelor and Masters Degrees level. This is in a sharp contrast to what it used to be when candidates were reluctant to enroll in journalism as the preferred career choice as against courses such as Medicine, Accounting, Law and Architecture.

There is no doubt that journalism is a profession that needs both male and female gender. However, it has been observed that there are more female students studying mass communication than those practicing or aspiring to become journalists unlike their male counterparts. Various studies conducted across institutions offering journalism in Nigeria also indicate that there are more female students studying mass communication than their male counterparts. (Ali, 2010). Unfortunately, only a few of these female students follow through to make a career in journalism as it has been discovered that they prefer to have career in other areas of mass communication, such as public relations, advertizing, broadcasting, photo-journalism, news casting, news blogging and publishing.

According to Apuke (2016) in Gambo and Lenshie (2014), female gender in Nigerian is almost excluded in the discussion-making process. It is a known fact that women opportunities for participation are generally limited in Nigeria. This is central to the socio-economic and political organization of woman and sometimes, their total exclusion from the decision-making process at all levels in the society.

In recent years, media houses in the western countries have continued to have shortage of trained female journalists in various communication activities. The same could also be said of media houses in Nigeria as most of them have higher number of male journalist than female journalists. This, Ali (2010) posits that, “there has been an imbalance in the number of female and male trained journalists working with the media houses

1.1 Statement of The Problem

It is a known fact that a very high number of female journalists are produced yearly from various institutions offering mass communication, not only in Nigeria, but globally. However, the degree of their involvement in the practice of journalism is still very low. Traditionally, many are of the view that a female journalist should be restricted to some areas of specialization in journalism owing to issue of discrimination and the tedious nature of the profession. Also, due to religious and traditional believes, coupled with matrimonial responsibilities, it has been observed that women may not be able to professionally function as journalists in our society. This study therefore opens up on choice of career in journalism among female mass communication students, Federal Polytechnic, Ilaro.

1.2 Objective of The Study

In view of the problem discussed above, this study seeks to achieve the following objectives;

1. To ascertain whether or not marital status affect the choice of making career in journalism by female mass communication students of the FPI
2. To examine the choices available that appeal to female students of mass communication of FPI
3. To evaluate whether or not there’s a discrimination against female journalists in the media industry in Nigeria.
4. To ascertain if religion, marriage, tradition and culture affect the choice of a female graduate of mass communication from practicing journalism.

1.3 Research Questions

1. Does marital status affect the choice of making career in journalism by female mass communication students?
2. What are the choices available in journalism that appeal to female students of mass communication of Federal Polytechnic, Ilaro

3. Is there any discrimination against female journalists in the media industry in Nigeria?

4. How can religion, tradition and culture affect the choice of a female graduate of mass communication from practicing journalism?

2. LITERATURE REVIEW

Over the years, journalism as a profession has been seen as men’s job due to its dominance by the men folk. So many factors have been attributed to why female folk are not fully involved in the practice of journalism. Umar (2015) defines journalism as the occupation of reporting writing, editing, photographing or broadcasting news or of conducting any news organization as a business.

The word “journalism” according to Umar (2015) is derived from the word “journal” which implies a daily register or a diary or a book containing each day’s business or transaction. Journalism as a profession is not limited to a particular gender. Rather, it is a profession that is seen as suitable for both men and woman (Ememyeonu, 1991). But, most female prefer flamboyant roles in radio, television, advertising or public relations genres of journalism. This is where the idea of choice comes from for female graduates of mass communication in Nigeria.

Journalism is as media profession which offers a variety of career possibilities. In journalism, there are different career option opened to interested graduates to choose from. They include: Include: Photo journalism, news reporting, sports writing, investigative and interpretative journalism, freelancing or newspaper columns, news blogging, advertising and public relations etc.

Aina (2004) distinguished some of the careers available in journalism: a reporter differentiate various career in journalism, stating that a reporter is a journalist who seeks out some information using researches and interviews. Whereas, investigative journalism requires a “keener news-sense” than the traditional reporting technique.

Ojomo (2008) described photo journalism as “telling a story with photographs-reporting with the aid of picture”. Photo journalists are not ordinary photographers, they are professional photographers trained in the art of telling or reporting the news through the camera lens. In addition, we have sports presenters whose focus in all about reporting sporting automatics across the globe but nothing more. Same with political analysts, business analysts, health analysts, financial analysts and the new trend, the citizen journalism or news blogging news blogging is about using the internet network to report news activities and make it available to heterogenous audience as it happens through any form of social media platforms like Facebook, Instagram, WhatsApp etc.

In a study carried out by Ali (2010) to find out the attitude of female mass communication student towards journalism as a career, there’s a general belief that although a very large number of female graduates of journalism are produced from different higher institutions in Nigeria, whereas, only few of them actually practice journalism as a career. Findings revealed that female mass communication students have a negative attitude towards journalism as a career. Apuke (2018) cited in Feri and Keller (1986) sampled 136 female full-time news anchors in a commercial television station. Majority of them emphasized the fact that even the audience would prefer asking their male counterpart for the latest” hot” story. Studies have however discovered that career development of female journalists are mostly affected by gender based issues. Ibraheem (2018) in Okunna (2006) states that gender relations in Nigeria, are characterized by a lot of imbalance to the disadvantaged of women. Tradition, religion, culture and other factors have continued to widen the gap of disparity between men and women thereby reducing women to play second fiddle roles or subordinate positions.
Also, there is also a barrier of between functioning as a female journalist and keeping your family well intact. Reep and Dambiot (1987) in Apuke (2016) examined the possible effects of the stereotypes on the career development of female journalists. The research found out from a study of 813 programmes where lead roles were played by women who were financially successful excited about their career, and could be completed in demanding jobs. It was also discovered that majority of their respondents paid their price by being less than perfect mothers and by lacking remove.

Okunna (2006) states that the media are male dominated in terms of subject matters, news and people who report. Akinfeleye (1996) says that "there are 52 journalism/Mass communication training institutions offering different programmers from Diploma to Phd and Degree in Mass Communication in Nigeria. As at 1996 Akinfeleye compiled some of the institutions as University of Lagos, UNN, University of Maiduguri, Bayero University, Nnamdi Azikwe University, Akwa, Delta state University, Abraka etc. Nwodu (2005) in a study presented a data on the overall presence of women and men in the news, categories in three distinct ways as subjects, reporters and presenters.

<table>
<thead>
<tr>
<th>Duty</th>
<th>Females</th>
<th>Males</th>
<th>Females</th>
<th>Males</th>
<th>Total Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presenter</td>
<td>69%</td>
<td>31%</td>
<td>42</td>
<td>19</td>
<td>61</td>
</tr>
<tr>
<td>Reporters</td>
<td>5%</td>
<td>95%</td>
<td>4</td>
<td>71</td>
<td>75</td>
</tr>
<tr>
<td>Subjects</td>
<td>17%</td>
<td>83%</td>
<td>42</td>
<td>206</td>
<td>248</td>
</tr>
</tbody>
</table>

The above table shows the number of females and males occupying the position of presenters, reporters and subjects in the media industry in Nigeria. However, gender equality could not be ascertained as data presented above indicates that greater number of female appears in the media as presenters than males. 42(69%) out of the 61 news presenters were females, while 19 (31%) were males. 4(5%) out of 75 reporters were females, while 71(95%) were males. Also 42(17%) out of 248 subjects in the news were females while 206 (83%) were males. From the above, it could be seen that woman feel more comfortable as presenters than being reporters due to certain factors.

This study adopted social cognitive theory. The theory was propounded by Philip and Ziller (1992). Only social category theory has been observed to have similar modes of orientation and behavioring which relate people in the same social category to such phenomena as mass communication in similar ways. They theory posits that “members of contemporary urban-industrial societies could be structured into social categories based on common characteristics and might be classified into social categories based on common characteristics like social class, religion ethnic identity and rural residence, and that such categorization has implementations for mass communication message”. According to Ibraheem (2018) in Aina (2003), its origin stems from the need of advertisers for specialized audiences. It is assumed that the categories to which individuals belong provide them with similar frame of reference and cognition. Agbo, Ojobor and Ezinwa (2008) also stressed that “members of a particular social category will select more or less similar communication content and will respond to it roughly in equal way”. Therefore, most female mass communication students, who belong to the same social category in the society, develop negative attitudes towards journalism as a career. As most of the female communicators are negatively affected by the discriminations from the society and their families, it implies that they have responded to the idea of not accepting the choice of journalism as a career.

3. METHODOLOGY

This study adopts a quantitative design. The survey method is employed. Survey is “a research method, which focuses on a representative sample derived from the entire population of study (Nwodu, 2006). This approach is very important as it deals with attitude towards making a choice and perceptions of respondents. The instrument
of data collection is questionnaire. The population of the entire students of mass communication makes it impossible to study every female student in the department of mass communication, Federal Polytechnic, Ilaro. Therefore, a sample size was drawn. 120 respondents was selected randomly from the study comprising of 30 from ND1 (Full Time), 30 from ND II (Full Time and 60 from both ND I Part Time and ND II (PART Time) and 120 copies of questionnaire were distributed but only 108 questionnaires were duly filled and retrieved with a response rate of 90% and a rejection rate of 10%

4 DATA PRESENTATION

Do you like journalism?

<table>
<thead>
<tr>
<th>Option</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>98</td>
<td>90.7</td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>9.3</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Field study, 2019.

The table above shows that 91% respondents like journalism, while 10% doesn’t like journalism. This shows an acceptance that female mass communication students like journalism as a profession.

Table 2: Will you choose journalism as a career?

<table>
<thead>
<tr>
<th>Option</th>
<th>Frequency</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>20</td>
<td>18.5%</td>
</tr>
<tr>
<td>No</td>
<td>88</td>
<td>81.5%</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field study, 2019.

The table above shows that 88% respondents of the students will not choose journalism as a career, while 20% will choose journalism as a career.

Table 3: What aspect of journalism are preferable to you as a female student of mass communication, Federal Polytechnic, Ilaro.

<table>
<thead>
<tr>
<th>Option</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>News casting</td>
<td>51</td>
<td>47.2%</td>
</tr>
<tr>
<td>News blogging</td>
<td>19</td>
<td>17.6%</td>
</tr>
<tr>
<td>News reporting</td>
<td>16</td>
<td>14.8%</td>
</tr>
<tr>
<td>Investigative journalism</td>
<td>05</td>
<td>04.6%</td>
</tr>
<tr>
<td>Advertizing and public relations</td>
<td>17</td>
<td>15.7%</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field study, 2019

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1st National Conference of WITTED, Ilaro Chapter
The above table indicates that 47.2% respondents prefer News Casting as a career, 19% prefer News blogging, 17% will go for advertizing and Public Relations. While 5% prefer Investigative journalism and 16% will go for News reporting.

Table 4: How would you assess the moral standard of woman practicing journalism.

<table>
<thead>
<tr>
<th>Option</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>45</td>
<td>41.7%</td>
</tr>
<tr>
<td>Very good</td>
<td>56</td>
<td>51.9%</td>
</tr>
<tr>
<td>Undecided</td>
<td>7</td>
<td>06.5%</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field study, 2019.

The table shows that 51% respondents believed that their moral standard is very good, while 41% good and 6% were undecided.

Table 5: Do you think Journalism is strictly a male profession

<table>
<thead>
<tr>
<th>Option</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>20</td>
<td>18.5</td>
</tr>
<tr>
<td>False</td>
<td>70</td>
<td>68.5</td>
</tr>
<tr>
<td>Undecided</td>
<td>14</td>
<td>13.0</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field study, 2019.

The table shows 68% false against Journalism as strictly a male profession, 18.5% respondents agreed it is a male profession, while 13% were undecided.

Table 6: Do marital status determines the choice of journalism as a career for a female mass communication student?

<table>
<thead>
<tr>
<th>Option</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>92</td>
<td>85.2%</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>14.8%</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field study, 2019.

The table shows that 85.2% of the respondents agreed that marital status of a female determines the choice of journalism as a career. While 14.8% said ‘No’.
Table 7: Is there any discrimination against female journalism in Nigeria?

<table>
<thead>
<tr>
<th>Option</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>85</td>
<td>81%</td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>9%</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field study, 2019.

The table shows that 81% of the respondents agreed there is discrimination against female journalists in Nigeria.

Table 8: Have you ever been discriminated against as a female student journalist?

<table>
<thead>
<tr>
<th>Option</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>90</td>
<td>83%</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>14.8</td>
</tr>
<tr>
<td>Undecided</td>
<td>02</td>
<td>1.85%</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field study, 2019

90% of the respondents said they have been discriminated against, while 14% have not been discriminated against. 1.85% were undecided.

Table 9: Does religion affects the choice of journalism as a career among female mass communication students of the federal polytechnic, Ilaro?

<table>
<thead>
<tr>
<th>Option</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Valid percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>94</td>
<td>87%</td>
<td>87%</td>
</tr>
<tr>
<td>False</td>
<td>10</td>
<td>100%(9.25)</td>
<td>9.3%</td>
</tr>
<tr>
<td>Undecided</td>
<td>04</td>
<td>2.7% (3.7)</td>
<td>3.7%</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field study, 2019

The table above indicates 87% of the respondents agreed that religion affects the choice of journalism as a career among the female mass communication students of the Federal Polytechnic, Ilaro. 9.3% believed otherwise and 3.7% were undecided.

5. DISCUSSION OF FINDINGS

From Table 2 based on the questionnaire, it is observed that the response from the respondents agrees that 98% prefer Journalism as a career while 10% do not like journalism. The observation from Table 2 shows that 82% of the respondents will not choose journalism as a career while the remaining 18.5% respondents will want to choose journalism as a career by choice. Table 3: suggested to the respondents that what aspect of journalism are preferable to them as female students of mass communication, federal polytechnic, ilaro. It is observed the
47.2% chose news casting aspect of journalism, 17% chose new blogging, 14.8% prefer new reporting, 4.6% will go for investigative journalism and 15.7% prefer to do advertising and public relations aspect of journalism.

From table 4, it showed that 41.7% accepted the standard of women practicing journalism to be good. 51.9% acknowledged the standard of women of practicing journalism to be very good. 6.5% do not give their opinion on the standard of woman practicing journalism. Table 5: 18.5% of the respondents adjudged that journalism is strictly a male profession, 68.5% of the respondents also believed that journalism is not strictly a male profession while 13% were undecided. Table 6: 85.2% agreed that marital status determines the choice of journalism as a career for a female mass communication student, 14.5% agree that marital status do not determine the choice of journalism as a career for a female student. Table 7: 81% respondents agreed that there is discrimination against female journalists while 20% respondents agreed that there is no discrimination against female journalism.

Table 8: from the table, it is observed that 83% of the respondents agreed that there is discrimination against female student journalists on the ground of religion and cultural behavior, while 14.8% believe that female students of journalism cannot be discriminated against on the ground of religion, while 2% remain adamant. Table 9: 87% agreed that religion affects the career choice in journalism among female mass communication students, federal polytechnic, Ilaro while 9.3% opined that religion do not affect the career choice of journalism among female mass communication students. 3.7% were undecided.

6. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Religion and cultural belief also have a role to play in influencing the choice of female students of mass communication in choosing a profession like journalism. While some religions forbid a woman to carry out an interview in some places, some cultures see women working in any capacity as a taboo, especially when such a woman is married. Some employers of labour too, usually discriminate against women when it comes to employing journalists in the media industry. The existence of new media has also paved way for more women graduates of mass communication to practice through the use of internet to practice citizen journalism by operating news blogs without any discrimination or marital effect. While others prefer news casting and working as Public Relations personnel, another set of these female students would rather choose a career in advertising than venturing into journalism.

6.1 Recommendations

While all these are factors that have served as impediments to the choice of female mass communication, it is recommended that for more female graduates of mass communication, especially from the Federal Polytechnic, Ilaro should be encouraged to practice journalism as a career. It is also recommended that husbands should support their wives into making a career in journalism. Also, religious bias as well as cultural beliefs should be jettisoned in order to encourage more women participation in the practice of journalism. There is a general belief that, ‘what a man can do, a woman can do better’, hence, employers of labour should stop discriminating against women in the industry by making provisions for employment and give them the necessary support in order to yield the needed result. Also, government should promulgate a law that mandates media owners to employ at least 40% - 50% of female journalists in their establishments in order to erode discrimination and encourage more participation.

REFERENCES


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TERTIARY EDUCATION STUDENTS’ PERCEPTIONS OF THE EFFECTIVENESS OF MENTORING IN TRANSLATING ENTREPRENEURIAL INTENTIONS TO ACTIONS IN NIGERIA

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ABSTRACT

The study was conducted to examine the perception of tertiary education students on the effectiveness of entrepreneurial mentoring in translating the entrepreneurial intentions of transiting graduates to actions. The study adopted a purposive sampling technique by focusing on the final year students in the four schools represented at the Federal Polytechnic, Ilaro, Ogun State, Nigeria. Data was collected through a field survey by the self-administration of questionnaires to a sample of 291 students. Findings from the study reveal that skills and capacity required by the students to function optimally have been acquired and hence, influence their willingness and desire to take on entrepreneurship as a career. However, in line with the main objective of the study, outcome further shows that due to the visible harsh business environment in Nigeria, a right-time mentoring is imperative for translating the intentions of the would-be entrepreneurs to actions. Otherwise, the enthusiasm generated by entrepreneurship education may rapidly dissipate over time leading to rising unemployment in the country. Appropriate recommendations that will ensure the adoption of entrepreneurial mentoring required for translating intentions to entrepreneurial actions are made.

Key Words: Entrepreneurial Mentoring, Graduates’ Intentions, Business Environment, Actions, Unemployment

1 INTRODUCTION

The growth and development of any Nation lie in its youths and how productive and creative they are to contribute to the national output. Hence, it is the responsibility of every government to ensure that its youths are productive and engaged in productive activities in the country. The problem with Nigerian educational programme is too much emphasis on the value of certificate rather than the skills acquired by the carrier of such certificate. In other words, individual students struggle hard through any means to attain the Golden Fleece which is the certificate instead of the knowledge and skills which will make them to be productively employed and/or self-reliant (Florence, 2015).

The rate of unemployment among Nigerian youths is becoming alarming. Recent reports from the National Bureau of Statistics, NBS (2019) revealed that unemployment rate in Nigeria has spiked to its all time high at 23.10% in the last quarter of 2018 from 21.8% in 2017 and an average of 13.3% from 2006 to 2016. Unemployment among the youths is the highest at 36.4% in 2018. This prompted the attention of the Government and major stakeholders in the education sector to review the education curriculum in order to produce quality and skilled graduates that will be self reliant.

According to Lemo (2013), given the worsening situation of unemployment among the Nigerian youths entrepreneurship remains the viable option to become self-employed, reduce unemployment, poverty, and empower the youths to develop their businesses, pursue their dreams and contribute to the overall productive capacity and national economic growth and development (Efe-Imafidan et al, 2017). This necessitated the introduction of entrepreneurship education into the curricula of tertiary institutions in Nigeria. The main objective of the policy is to enable the undergraduates in the Polytechnics and Universities to acquire skills that will make them to be self-reliant and job creators rather than job seekers after graduation.

Implementation of the policy has commenced across the Nigerian universities and polytechnics, but the major challenge confronting the progress of the policy which seems to have defeated its primary objective is that skills
acquired by students during their entrepreneurial programmes are not often translated into actions after graduation. Therefore, effective mentoring of the undergraduates in the Nigerian tertiary institutions on entrepreneurial skills acquisition has become necessary for them to translate the skills acquired during their studies into actions after graduation.

Mentoring plays a critical role in the success of students on their carrier development not only in the knowledge and skills that are shared but also because of the many other aspects of professional socialization and experiences that are needed to facilitate success in life activities after school (University of Michigan, 2015). Mentoring is well recognized as a strategy for personal and carrier development and is commonly used in progressive business enterprises and learning institutions. It is the empowering of mentee by developing his or her abilities through the instilling of "can do" spirit by the mentor (Judy & Mack, 2007). Mentoring usually provides guidance and advice to the mentee on real life situations. This will enable the mentee to cope with the challenges that may cross their path on their carrier development. Mentors are those people who through their deeds and thoughts help others to develop their skills and realize their potentials. Given the Nigerian business environment, mentoring will help transiting students to be familiar with challenges associated with their chosen businesses and build confidence on how to succeed within the business environment (Tikloba & Holienka, 2016). Mentorship from experienced entrepreneurs can provide students with a greater level of confidence and inspiration. This is because it will be inspiring for students to hear how a successful business was created directly from its founder, and can be more effective than been mentored by a mere employee (Afolayan, 2016; Chukwu & Uzochukwu, 2013).

This study therefore seeks to examine the role of mentoring in ensuring that the entrepreneurial skills acquired by students during their entrepreneurial programme as tertiary education undergraduates are translated into actions after graduation. In order to achieve this objective, the paper is divided into five sections. Following this introductory section is section 2 which conducts a brief overview of previous works that are relevant to the study. This is closely followed by section 3 which focuses on the methodology of the study. Section 4 analyses the data and discusses the findings while section 5 which is the last section concludes the study with some recommendations.

2 LITERATURE REVIEW

Although, studies on mentoring in educational development abound in the literature few of these however, examine the relationship between mentoring and entrepreneurial development in the educational context. The impact of mentoring in entrepreneurial development has been summarized from many researches.

Tikloba and Holienka (2016) investigate the experiences associated with entrepreneurship mentoring in Slovakia and findings from the study revealed that mentoring significantly impact business expansion, creates new jobs and increases the rate of employment. This subsequently enhances the development of individual regions of Slovakia. This implies that a nation that adopts entrepreneurial development is likely to experience a multiplier effect that can leapfrog the development of such country’s economy.

Chuck and Yanbo (2014) posit that mentorship from experienced entrepreneur increases the likelihood of students to engage in entrepreneurship after graduation. The study also examines how the likelihood of students embracing start-up career is affected by entrepreneur mentor. The outcome shows that students who are opportune to be mentored by entrepreneurs take up entrepreneurship as a career choice after graduation. The outcome further reveals that parental mentorship equally has a positive significant influence on students’ choice of entrepreneurship after graduation. Obviously, the collaboration of mentoring from both the experienced entrepreneurs and that of the parents has an influence on the decisions of the students to consider entrepreneurship as their choice of career.

Illesanmi and Lasisi (2015) examine the role of mentoring in business development and the outcome reveals that mentorship provides a wide range of benefits such as welfare, satisfaction, development, progress, rejuvenated feelings in career development, knowledge on how to use new technologies, becoming aware of business issues, methods, strategies or perspectives that are vital to busuness.

Peter and Geartjian (2013) investigate the benefits and impact of mentoring for entrepreneurs; the results show that the benefits of mentoring are determined by the psychosocial support the entrepreneur provides, the amount of trust and the intensity, while the long term impact is determined by the experienced benefits and not by mentoring activities. The study analyses psychosocial support as that which enhances and assists in building a
mentee’s self worth by offering protection. The outcome of their study corroborates the finding of Kirchmeyer (2005) that psychosocial support-type of mentoring enhances a mentee’s performance.

In the same vein, Florence (2015) conducts a research work titled “Entrepreneurship skills acquisition and the benefits among the undergraduates in Nigeria”. The findings of the study revealed that entrepreneurship education is a vital tool in solving the endemic problem of youth unemployment. It gives young people the opportunities to develop their skills and become job creators rather than job seekers after graduation.

Similarly, Ben and Jack (2014) execute a study on mentoring and facilitation in entrepreneurship education by combining classroom observations with semi-structured interviews from mentors and students. The data provides a complete view of mentoring behaviours and their salience within an entrepreneurship learning environment. Their findings reveal that mentoring creates student-mentor relationship that helps students learning process. It also shows that role modeling provides a concrete vision of what students are seeking to learn and establishes the mentor’s credibility in a way that enables students to learn from their experiences.

3 METHODOLOGY

The study adopted purposive sampling technique with a focus on the cross-section of the final year students in the various faculties represented at a selected polytechnic in Ogun State, Nigeria. The Polytechnic of study is the Federal Polytechnic, Ilaro. Purposive sampling technique and the choice of the final year students are informed by the fact that these categories of students have taken part in entrepreneurial education, and are also at the last stage of their educational pursuit prior entry into the labour market to face their professional career choice. Thereafter, a simple random sampling technique was used to select respondents from each of the departments that make up the studied faculties in the selected institution. This is with a view to avoiding the challenge of selection bias. To arrive at the sample size, Raosoft sample size calculator was employed (Chimucheka, 2013) to give 291 elements.

Data were collected through the administration of questionnaires to the selected sample of 291 final year students (who are the focus of the study) drawn from the departments in the four faculties that make up the institution. These are the schools of Applied Sciences, Engineering, Environmental Studies and Management Studies respectively. The questionnaire was adapted from the previous studies on entrepreneurial intentions (Aslam, Awan & Khan, 2012; Ekpo & Edet, 2011; Fatoki & Oni, 2014). To achieve the objective of study, the survey questionnaire was categorized into three sections. Section ‘A’ probed career intentions and the skills acquired by the students through entrepreneurial education. Section ‘B’ comprised 18 item questions with a 5 point Likert-Scale ranging from Strongly Agree (5 points) to Undecided (1 point). Items 1-10 examined the students’ perceived barriers to starting a business while items 11-18 investigated the benefits of entrepreneurship education. Section ‘C’ (which is the major contribution to the body of knowledge) sought the perceptions of students on: (1) whether and how effective mentoring can moderate students’ entrepreneurial intentions to affect entrepreneurial actions; and (2) identify the type of mentoring they considered more efficient and effective.

The questionnaires were administered to all the sampled students by the researchers in their various classes with the assistance of their lecturers, filled and returned thereby, making it possible to retrieve all the distributed questionnaires with a 100% response rate. The descriptive method was adopted to analyse the collected data using frequencies and simple percentages.

4 RESULTS AND DISCUSSION

This section deals with the presentation of findings of the study using frequency tables and simple percentages, as well as the discussion of the findings.

4.1 Responses on Research Questions

4.1.1 Students’ Career Intentions and Skills Acquired from Entrepreneurship Education

Out of the 291 respondents, 46.05% (134) which is in the majority indicated self employment as their immediate carrier choice after graduation, 25.8% (75) indicated further studies and part-time business, 13.4% (39) further studies, 8.9% (26) wage employment and part-time business while 5.8% (17) indicated wage employment. Table 1 outlines the career intentions of students and acquired skills while undergoing entrepreneurial education. As shown in the findings in Table 1, majority of the respondents indicated their
intentions for self-employment after graduation. Their preference for starting businesses of their own is an indication that entrepreneurial education has positively impacted them to even consider self-employment as a career option contrary to the usual norm of preference for remunerative jobs in the formal sector. However, it is not unlikely that the experience of those who have graduated in the past but without jobs, and the rising rate of unemployment in the country might have influenced their decisions.

Apparently, the study reveals that 25.8% indicated their willingness for further studies and part-time business most probably to enhance their knowledge and competence, as well as have a source of income to support them. Equally revealing is the intentions of 39 (13.4%) to further their studies, 26 (8.9%) preferred joint career intentions (that is, wage employment and part-time business) while 17 (5.8%) showed a preference for wage employment. The preference for a joint career can be associated with the strategy to diversify and provide a buffer in case of any unexpected happenings. Another plausible explanation is the strategy for generating funds from the wage employment to finance and grow business. Afolayan (2016); Ekpoh and Edet (2011) in their various studies submitted that affordable and appropriate access to finance is a challenge to business (both newly-starting and the existing ones) in Nigeria. Findings from the study reveal that wage employment is the least preferred (5.8%) by the respondents contrary to Ekpoh and Edet (2011) who conducted a similar study in Akwa Ibom and Cross River states, Nigeria in 2011 respectively. Outcomes from the study of Ekpoh and Edet clearly show that wage employment in the formal sector is the most preferred. The outcome of this study may not be unconnected with the reality on ground where the labour absorptive capacity of the economy has reduced drastically and seems not to match the graduates’ turn-out from the educational institutions. The rising rate of unemployment coupled with the large exodus of labour-intensive industries out of the country may have totally changed the orientation of youths from remunerative job seekers in the formal sector to that of job creators.

Equally revealed in Table 1 is the level of skills acquired in the course of taking entrepreneurial education as rated by the sampled students. A significant proportion of the respondents is shown to acquire a moderate level of skills (57.4%), 23.7% indicated high skills while 18.9% reveals that low skills are acquired. Implied from this outcome is that entrepreneurial education to a large extent, has impacted positively on the respondents and has enhanced their level of skills. This finding supports that of Ekpoh and Edet, 2011; Fatoki and Oni (2014).

Table 1: Career Intentions and Acquired Skills by the Respondents

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate carrier choice after graduation</td>
<td>Further studies 134 (46.05%) Self employment 17 (5.8%) Wage employment 75 (25.8%) Further studies and part-time business 26 (8.9%)</td>
</tr>
<tr>
<td>Rate the level of skills acquired during the education</td>
<td>Low 55 (18.9%) Moderate 167 (57.4%) High 69 (23.7%)</td>
</tr>
</tbody>
</table>

Source: Authors’ Compilation

Further revealed by the study is the fact that a number of obstacles hinder business start-up as perceived by the respondents. Evidence from Table 2 reveals that major amongst the barriers as agreed to by the sampled students include lack of social connections to resource providers in entrepreneurship (78.6%), lack of access to financial resources (73.5%), (70.1%) poor infrastructural facilities (such as electricity, bad road networks, etc.), lack of good policies and effective regulations (64.6%), fear of failure (57.8%), inability to explore business opportunities (57.7%), concerns about entrepreneurial ability or efficacy (57%), lack of business/entrepreneurial mentoring (55.4%) and lack of information about business start-up (47.7%) amongst others. This outcome
supports the earlier findings of Owusu-Ansah (2004); Ekpoh and Edet (2011) who reported that many students and graduates perceive diverse obstacles that relatively affect the outcomes of entrepreneurial programmes. On the contrary however, majority (69.7%) of the respondents disagree with the opinion that lack of business ideas is a barrier to business start-up. This contradicts the finding of Ekpoh and Edet (2011) which showed that lack of business ideas is major among the barriers to starting a business venture.

Table 2: Perceived Barriers to Business Start-Up

<table>
<thead>
<tr>
<th>Questions</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Undecided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of access to financial resources</td>
<td>106 (36.4%)</td>
<td>108</td>
<td>23</td>
<td>37 (12.7%)</td>
<td>17</td>
</tr>
<tr>
<td>Poor infrastructural facilities (e.g. electricity, bad road networks, etc)</td>
<td>91 (31.3%)</td>
<td>113</td>
<td>42</td>
<td>35 (12.0%)</td>
<td>10</td>
</tr>
<tr>
<td>Lack of business ideas</td>
<td>32 (11.0%)</td>
<td>51</td>
<td>99</td>
<td>104 (35.7%)</td>
<td>5</td>
</tr>
<tr>
<td>Fear of failure</td>
<td>38 (13.1%)</td>
<td>130</td>
<td>74</td>
<td>36 (12.4%)</td>
<td>13</td>
</tr>
<tr>
<td>Lack of information about business start-up</td>
<td>24 (8.2%)</td>
<td>115</td>
<td>118</td>
<td>19 (6.5%)</td>
<td>15</td>
</tr>
<tr>
<td>Lack of business/entrepreneurial mentoring</td>
<td>52 (17.9%)</td>
<td>109</td>
<td>108</td>
<td>16 (5.5%)</td>
<td>6</td>
</tr>
<tr>
<td>Concerns about entrepreneurial ability or efficacy</td>
<td>69 (23.7%)</td>
<td>97</td>
<td>63</td>
<td>28 (9.6%)</td>
<td>34</td>
</tr>
<tr>
<td>Inability to explore business opportunities</td>
<td>57 (19.6%)</td>
<td>111</td>
<td>107</td>
<td>13 (4.5%)</td>
<td>3</td>
</tr>
<tr>
<td>Lack of good policies and effective regulations</td>
<td>61 (21.0%)</td>
<td>127</td>
<td>62</td>
<td>25 (8.6%)</td>
<td>16</td>
</tr>
<tr>
<td>Lack of social connections to resource providers in entrepreneurship</td>
<td>111 (38.1%)</td>
<td>118</td>
<td>33</td>
<td>23 (7.9%)</td>
<td>6</td>
</tr>
</tbody>
</table>

Having established the intentions of the students of entrepreneurial programme to take up entrepreneurship as a career after graduation as well as identified the perceived barriers to starting business in Nigeria, the study specifically examines the role of entrepreneurial mentoring as perceived by the respondents in translating intentions to actions after graduation being the core objective of the study. The findings are reported in Table 3 as shown:
Table 3: Students’ Perceptions about the Role of Entrepreneurial Mentoring

<table>
<thead>
<tr>
<th>Question</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which type of mentoring do you personally prefer</td>
<td>Strongest-based mentoring: 73</td>
</tr>
<tr>
<td></td>
<td>Building mentee’s self-worth</td>
</tr>
<tr>
<td></td>
<td>Protection-enhanced: 21</td>
</tr>
<tr>
<td></td>
<td>Career support through acting:</td>
</tr>
<tr>
<td></td>
<td>153</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>In your opinion, effective mentoring will assist students put their</td>
<td>Strongly Agree: 151</td>
</tr>
<tr>
<td>acquired skills during entrepreneurship into action after graduation</td>
<td>Agree: 128</td>
</tr>
<tr>
<td></td>
<td>Disagree: 6</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree: 5</td>
</tr>
<tr>
<td></td>
<td>Undecided: 1</td>
</tr>
<tr>
<td>Effective mentoring will help reduce the rate of unemployment among</td>
<td>Strongly Agree: 126</td>
</tr>
<tr>
<td>youths in Nigeria</td>
<td>Agree: 131</td>
</tr>
<tr>
<td></td>
<td>Disagree: 23</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree: 10</td>
</tr>
<tr>
<td></td>
<td>Undecided: 1</td>
</tr>
<tr>
<td>Entrepreneurial education helps to develop creativity</td>
<td>Strongly Agree: 132</td>
</tr>
<tr>
<td></td>
<td>Agree: 117</td>
</tr>
<tr>
<td></td>
<td>Disagree: 31</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree: 8</td>
</tr>
<tr>
<td></td>
<td>Undecided: 3</td>
</tr>
<tr>
<td>Creating awareness of business opportunities</td>
<td>Strongly Agree: 144</td>
</tr>
<tr>
<td></td>
<td>Agree: 102</td>
</tr>
<tr>
<td></td>
<td>Disagree: 33</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree: 9</td>
</tr>
<tr>
<td></td>
<td>Undecided: 3</td>
</tr>
<tr>
<td>Building of self-confidence</td>
<td>Strongly Agree: 120</td>
</tr>
<tr>
<td></td>
<td>Agree: 115</td>
</tr>
<tr>
<td></td>
<td>Disagree: 29</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree: 25</td>
</tr>
<tr>
<td></td>
<td>Undecided: 2</td>
</tr>
<tr>
<td>Giving exposure to entrepreneurial process</td>
<td>Strongly Agree: 93</td>
</tr>
<tr>
<td></td>
<td>Agree: 149</td>
</tr>
<tr>
<td></td>
<td>Disagree: 20</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree: 17</td>
</tr>
<tr>
<td></td>
<td>Undecided: 12</td>
</tr>
<tr>
<td>Developing</td>
<td>Strongly Agree: 85</td>
</tr>
<tr>
<td></td>
<td>Agree: 168</td>
</tr>
<tr>
<td></td>
<td>Disagree: 22</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree: 11</td>
</tr>
<tr>
<td></td>
<td>Undecided: 5</td>
</tr>
</tbody>
</table>
Evidence from Table 3 reveals that the majority who constitute 52.6% (153) of the respondents show preference for career support through mentor acting (for instance, as a sponsor to his/her mentee) above strength-based (25.1%), psychosocial support (15.1%) which builds mentee’s self worth as well as protection-enhanced (7.2%). Kirchmeyer (2005) has claimed that psychosocial support is an indirect help of a mentor which enhances a mentee’s performance while career support is a direct help and it is political in nature. Kram (1983) (cited in Afolayan, 2016) identified career and psychosocial supports as the twin concepts which are pivotal to mentoring theory. Findings from the study as shown in Table 3 reveal that majority of the respondents agreed to the fact that entrepreneurial mentoring plays a significant role in assisting graduates transiting from school to cope with a new situation thereby, achieving his aspiration of becoming a successful entrepreneur. This may subsequently reduce unemployment and enhance economic growth.

Specifically, evidence from Table 3 indicates that 95.9% of the sampled students agreed that effective mentoring will assist graduates put their acquired skills during entrepreneurship education into action after graduation. Equally, 88.3% believed that effective mentoring will help reduce the rate of unemployment among youths in Nigeria. Similarly, 85.6% hold the belief that entrepreneurial education helps to develop creativity, creates awareness of business opportunities (84.6%), build self confidence (80.7%), give exposure to entrepreneurship process (83.2%), awaken their entrepreneurship awareness thereby making them entrepreneur-oriented (83.5%), give individuals motivation to start their own business (80.4%), and also that entrepreneurial education gives financial management skills (78.3%). The findings from the study imply that entrepreneurial mentoring can moderate entrepreneurial intentions significantly to positively impact actions especially, when it is perceived that the potential entrepreneur may be faced with challenges/obstacles to entrepreneurial development.

5.0 CONCLUSION AND RECOMMENDATIONS

Career intentions of students that have undergone entrepreneurial education are not in doubt as established in the literature and also revealed by the outcomes of this study where majority of the respondents desire to be self employed after graduation. This means that the students are positively influenced by entrepreneurial education and therefore, desire to become entrepreneurs. In other words, it implies that all the necessary skills, capacity, habit and attitude required for job creation and for becoming employers of labour have been acquired by the students. However, in line with the main objective of the study and as evident in the findings, availability of the right-in-time mentoring (either in the form of psychosocial or career support) is crucial for translating entrepreneurial intentions of graduates transiting from school to actions through self-employment with a view to curbing the rising rate of unemployment in Nigeria. Nigerian business environment according to Agboli and Ukaegbu (2006), also evident from the findings of the study is harsh and unfriendly to the development of business hence, an effective mentoring expectedly will encourage and motivate the prospective entrepreneur to be tenacious even in the face of daunting challenges (Bamkole, 2007). Based on the findings of the study, the following suggestions are made:
The three pronged factor for entrepreneurial development (which include the government, business owners and educational institutions) entails the collaborative efforts among the three bodies (through the forward and backward integration or linkage) to ensure the development and execution of functional curricular that will promote entrepreneurial development for the achievement of sustainable economic development.

Provision of enabling environment is essential and indisputable to motivate prospective entrepreneurs and encourage embracing entrepreneurship as a means of livelihood, thereby actualizing the entrepreneurial intentions of the transiting young graduates by allaying fear of failure.

Informal support in the form of after-school mentoring programme may be considered relevant through the inculcation of same in the institutions’ curricula by the regulators of the tertiary institutions (i.e. NUC, NBTE, and other related institutions). NYSC is implementing something similar to this during the graduates’ one year compulsory youth service corps (probably in their various camps). This can be augmented by the institutions via their regulators before embarking on the youth service corps. This will expose them to real life experiences and open them up to what is obtainable in the real world of business.

The study is limited because it was conducted using only one tertiary institution. Hence, caution must be exercised while interpreting the findings and making generalisations. Further studies on this topic could consider a larger sample size through a cross-sectional analysis with the investigation involving more tertiary institutions in Nigeria, for larger degrees of freedom. Furthermore, the study relied solely on descriptive analysis using mainly frequencies and simple percentages. Future studies may subject the collected data to statistical test for validation of the claims, in order to ensure robustness and authenticity.

REFERENCES


ABSTRACT
Tourism is a major force in any economy in the world; it is one sector of the economy that has a global importance. In this world of globalization where change is constant tourism tends to improve the economy of the third world countries and also have an impact upon the host community. The data used was collected from a survey carried out with a sample size of ninety four form a primary source using interview method. From the analysis, the initial interest (yes) for tourism was 40% while no was 60%. The interest later drop to 25% yes while no was 75%. The result show a decrease in the interest for tourism which become stationary at the 10th step of the transition. The state for both (yes, no) shows a recurrent state.

Keyword: Tourism, globalization, Markov chain, Transition, States

1.0 INTRODUCTION
Tourism is a major force in any economy in the world; it is one sector of the economy that has a global importance. In this world of globalization where change is constant tourism tends to improve the economy of the third world countries and also have an impact upon the host community. Tourism is the largest and fastest growing industry in the world. International organizations support tourism for its contribution to of world peace, poverty alleviation and also intermingling people and culture.

African countries are surrounded by coastal line which makes them more attractive to tourist, such like the beaches in Lagos, Nigeria, the world’s highest sand dunes in South Africa, the wild life experience in the safari in Tanzania. With these tourism potentials, it makes tourism very important in developing countries taking into consideration the untapped natural resources blessed within the shores of these African countries.

Tourism is a product that is based upon simultaneous production and consumption. Before we look into tourism development, let us define the concept of tourism development. Tourism development refers to all the activities associated with providing facilities for tourists in a destination. In involves activities such as skills development, job and wealth creation, and marketing. Marketing of various tourist destinations through liaison, training and advice of local tourism businesses promotes tourism development. With the understanding of tourism development we can deduce the importance of tourism in developing countries and its economic impact on them (Ateljevic & Page 2009).

The tourist industry is growing at a respectable rate of 7.2% in Africa per year. this number has the potential to be much higher, but developing tourism requires an abundant amount of factors besides building a lovely lodge of having a wealth of beauty and wildlife on your doorstep. A successful tourism sector relies on good safety and security, health and hygiene, infrastructure, education and training. Developing tourism can help achieve some of these important goals. (Kolb 2006).

Tourism developing in developing countries is very vital in contribution to economic growth of these countries. Countries which are classified as developing countries include nations in Asia, African and the Middle belt continent. Based on this report, Africa continent would be taken into consideration because of the natural resources that these countries have been blessed with.
The development of tourism is largely categorized by creation of basic infrastructures in the host community. Tourism development involves careful planning, administration and management. The ideal of developing tourism in a region is based on the infrastructures that are put in place. This facility brings about the development of tourism in the region. The presence of good facility helps to improve economic impact of tourism on the host community, having in mind that community is the major factor to modern tourism (Godfrey and Clarke 2000).

However, communities were the basic element in the supply of accommodation, transport facilities and services. As the trends goes on the inflow of tourist will be on the increase, thereby creating avenue for hotel business and restaurants. As the process of development continues, the government and private investors would be encouraged to invest more in the tourism industry. The cooperation of the government and private investors would bring about the creating of games parks, amusement parks, and other facilities that can bring much improvement to the development of tourism.

As it was mentioned above, tourism is a fast growing industry in the world. It has become potentially important for some countries as their major source of income. Apart from being an economic backbone of some countries, it also helps in the social life of the host communities. In d developed countries such as France and Spain, tourism has contributed immensely to the growth of the country. In the last decade, Tourism has played an increasingly major role in the economic development of many countries. The growth has been driven by an increase in demand and in the effort of the supply destinations. As such, demand for tourism is a fundamental element in the tourism system. The level of tourism demand has reached an unexpected level in the new millennium thereby providing the tourism industry and other tourism stakeholders a great challenge (Godfrey and Clarke, 200, 38).

Tourism marketing is the method of applying the correct marketing concepts and ideology to planning strategy to attract tourist to particular destinations which may come in form of resort, city, region or country. However, tourism and marketing go hand in hand. Marketing of tourism is very important because it is a process of planning and executing the conception, which includes pricing and promotion and distribution of ideals and goods and services. (Cooper et al 2008, 31). Marketing is a process of identifying customer’s satisfaction, design appropriate product and design a market to convey it to the final consumer (Pierre 2000). Tourism’s economic benefits and touted by the industry greater respect among the business community, public officials, and the public in general. This often translates into decisions or product policies officials, and the public general. This often translates into decision or public policies that are favourable to tourism. Community support is important for tourism, as it is an activity that affect the entire community. Tourism businesses depend extensively on each other as well as on other business, government and resident of the local community.

2.0 LITERATURE REVIEW

Fung and Alice (2014) examined the impact of cultural tourism to sustainable development in Nigeria. As far back as the middle of 15th century, the world has started experiencing an up surge in travels. Throughout the cause of human history, people have travelled for the purpose of adventures trade, religious conventions, war economic gain and other compelling motivations. The study revealed that it is only when deliberate efforts is injected into improving cultural tourism endowment that the patronage of tourist into cultural sites can increase the invariably transform them into money – spinning tourism resorts, to ensure to the cultural sites in terms of income generation, employment generation, provisions of more infrastructures to mention a few, as means of achieving improved tourism development hence, adequate sustainable development.

Esu (2015) paper seek to explore the role of tourism entrepreneurship in producing destination tourism spirit in Nigeria. Nigeria is a land richly endowed with natural and cultural resources. Concerted attempts have been made in the past five decade to build a viable tourism industry by government and a small number of operators, but not much has been achieved. The country has not been able to harness the abundant resources into attractive tourist product with high visitor-drawing power. Many reasons have been give for this ugly situation. The paper therefore conceptualized that, the possession of a resource base only give absolute advantage, but does not produce the desired level of industry spirit necessary to sell the destination, what matters most is the resource conversion rate of entrepreneurs. Nigeria does not currently have a tourism model capable of achieving 80% of tourism resource conversion rate. This paper therefore proposes a tourism sector development model that posits tourism entrepreneurship as the potential driver of the tourism industry. It also highlights specific entrepreneurial tourism operations destination development model (TDDDM) has the following four component: invention of tourism entrepreneurial programmes, harnessing the potential of existing hospitality enterprises in creating a tourism value chain, promoting community based tourism (CBT) in tourism resource management and creating effective tourism regulatory framework and infrastructural base. Key words: Tourism
entrepreneurship, tourism development, tourism industry, tourism business plan, community based tourism, tourism development model.

Due to the accelerated pace of modern life, consumers reduce time of purchase decisions and tend to choose services that match their own personality. The development of the brand of tourist destination needs to introduce new, appropriate extension to meet the needs of tourist in order to maintain exuberant vitality. So, what the perception of the brand personality of tourist destination is and whether it has an impact on the effectiveness of tourists’ evaluation of extended brand are needed to research based on tourism website on visitors’ reviews and advertisement on scenic areas, this paper examined Shandong Province and discussed differences in regional tourism brands. Firstly, tourist comments were collected from the tourism website and high-frequency words that describe individual characteristics using the content analysis method were extracted, Secondly, the characteristics of vocabulary acquisition were summarized the tourism brand personality dimension scale was used, put corresponding data into cross-contingency tables and obtains visitors’ destination personality perception differences. Thirdly, after using group discussion and the Delphi method to obtain the Shandong tourism projected brand personality and this was compared with tourists’ brand personalities, it was revealed that the perception of proves that tourism destination brand has a personality feature and the measurement of tourism brand personality dimensions should consider regional culture and resource advantages. Also, based on tourism’s demand market, either on tourists’ or on information acquired from actual travel. (Fung and Alice 2019)

For many tourist, a good night sleep is essential for business, creativity, travel and/or enjoyment of a holiday. To have better understanding on an optional environment for the tourist for the tourist to manage their sleep, this study aims to examine how the comfortability of sleep amenities and sleep environment cleanliness and sleep atmosphere influences tourists’ sleep quality by adopting the Pittsburgh Sleep Quality Index (PSQI). The Furog & Hon. (2019) show that the comfortability of sleep amenities, sleep environment cleanliness and sleep atmosphere is significantly related to sleep quality and tourists’ satisfaction. Specifically, sleep environment cleanliness is the most important contributing factor to both sleep quality and guest satisfaction. Sleep management and practical implications are discussed. (Ateljvic, 2009).

3.0 METHODOLOGY
A stochastic process is a system which involve in time undergoing chance fluctuations in another word a “Stochastic” process is a random phenomenon in a manner controlled by a probability law.

Markov chain
Markov chains are a fundamental part of stochastic processes. They are used widely in many different disciplines. A Markov chain is a stochastic process that satisfies the Markov property, which means that the past and future are independent when the present is known. This means that if one knows the current state of the process, then no additional information of its past states is required to make the best possible prediction of its future. This simplicity allows for great reduction of the number of parameters when studying such a process.

Markov chain is a sequence of random variables such that for any n, X_{n+1} is conditionally independent of X_{0}, \ldots, X_{n} given X_{n}. That is, the “next” state X_{n+1} of the process is independent of the “past” states X_{0}, \ldots, X_{n} provided that the “present” state X_{n} be known. It is required to possess a property that is usually characterized as “memoryless”; the probability distribution of the next state depends only on the current state and not on the sequence of events that preceded it. This specific kind of “memorylessness” is called the Markov property. Markov chains have many applications as statistical models of real-world processes. The stochastic process X=[X_{n}; n\in\mathbb{N}] is called a Markov chain provided that

\[ P(X_{n+1} = j | X_{0}, \ldots, X_{n}) = P(X_{n+1} = j | X_{n}) \]

for all j \in E and n\in\mathbb{N}.

State Space
The possible values in which Xn can take is refer to as state space (Academic State). 
X_{n} = (yes, no) = (X_{1}, X_{2})
Sample Size

The sample size \( n_{ij} \) is defined as \( n_{ij} = \) number of the sample in state \( ij \).

Where

\[
\begin{bmatrix}
\text{Past} & \text{Yes} & \text{No} \\
\text{Present} & n_{11} & n_{12} \\
\text{No} & n_{21} & n_{22}
\end{bmatrix}
\]

\( n_{11} = \) Those people who are tourist in the past and present  
\( n_{12} = \) Those people who are tourist in the past and present not  
\( n_{21} = \) Those people who are not tourist in the past but present they are tourist  
\( n_{22} = \) Those people who are not tourist in the past and present

\[
P_{ij} = \begin{bmatrix} p_{11} & p_{12} \\ p_{21} & p_{22} \end{bmatrix}
\]

Where \( p_{ij} \) is derived as  
\[
p_{ij} = \frac{n_{ij}}{n_i}.
\]

The percentage state of each random variable is derived as:

\[
X_1\% = \frac{n_{11}}{n_i} \times 100 \\
X_2\% = \frac{n_{12}}{n_i} \times 100
\]

\( S = (X_1\%, X_2\%) \)

Probability vector: A probability vector is a row vector in which the entries are non-negative and add up 1

Where \( \sum p_{ij} = 1 \) for each row

\[
X_0 = \text{Initiate} \\
X_1 = x_0 p_0 \\
X_2 = x_0 p_0^2 \\
X_3 = x_0 p_0^3 \\
\vdots \\
X_n = x_0 p_0^n
\]

Properties of Markov Chain

**Def.1** A state is said to be recurrent if, any time that we leave the state, we will return to that state in future with probability one.

**Def.2** A Markov Chain is irreducible if all the states communicate with each other (there is only one class)

**Def.3** State \( i \) and \( j \) communicate if they are accessible from each other, written as \( i \rightarrow j \)

**Def.4** Ergodic State is a state that is positive recurrent and aperiodic

**Def.5** A Markov Chain is ergodic if all states are ergodic.

4.0 ANALYSIS

The data used was collected from a survey carried out with a sample size of ninety four represented in the observation matrix \( (n_{ij}) \) below.

\[
n_{ij} = \begin{pmatrix} 32 & 14 \\ 7 & 41 \end{pmatrix}, \quad p_{ij} = \begin{pmatrix} 0.7 & 0.3 \\ 0.1 & 0.9 \end{pmatrix}, \quad x_0 = \begin{pmatrix} 0.4 & 0.6 \end{pmatrix}
\]

\[
x_0 p_0 = (0.4 \begin{pmatrix} 0.7 & 0.3 \\ 0.1 & 0.9 \end{pmatrix} \begin{pmatrix} 0.4 & 0.6 \end{pmatrix} = (0.34 \begin{pmatrix} 0.34 & 0.66 \end{pmatrix}
\]

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Studying the states

\[ p_{ij}^2 = \begin{pmatrix} 0.7 & 0.3 \\ 0.1 & 0.9 \end{pmatrix}^2 = \begin{pmatrix} 0.52 & 0.48 \\ 0.16 & 0.84 \end{pmatrix} \]

\[ p_{ij}^4 = \begin{pmatrix} 0.7 & 0.3 \\ 0.1 & 0.9 \end{pmatrix}^4 = \begin{pmatrix} 0.35 & 0.65 \\ 0.22 & 0.78 \end{pmatrix} \]

\[ p_{ij}^{10} = \begin{pmatrix} 0.7 & 0.3 \\ 0.1 & 0.9 \end{pmatrix}^{10} = \begin{pmatrix} 0.26 & 0.74 \\ 0.25 & 0.75 \end{pmatrix} \]

Findings

From the analysis the initial interest (yes) for tourism was 40% while no was 60%. The interest later drop to 25% yes while no was 75%. The result show a decrease in the interest for tourism which become stationary at the 10th step of the transition. The state for both (yes, no) shows a recurrent state.

5.0 CONCLUSION

Base on the result, it will be advisable to increase on the awareness for the need for tourism and the improvement on the tourist sites. Furthermore, the government must also come up to their responsibility on the need to add
REFERENCES


MICROBIAL QUALITY ASSESSMENT OF FROZEN POULTRY MEAT (CHICKEN AND TURKEY) SOLD IN ILARO

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ABSTRACT

This study evaluated the microbial assessment of frozen poultry meat sold in Ilaro environs. Four samples were analyzed and the total plate counts ranged from $32 \times 10^4$ cfu/g to $57 \times 10^4$ cfu/g, Coliform count ranged from $7 \times 10^4$ cfu/g to $55 \times 10^4$ cfu/g, Staphylococcus count range from $4 \times 10^4$ cfu/g to $36 \times 10^4$ cfu/g, Salmonella counts ranged from $8 \times 10^4$ cfu/g to $46 \times 10^4$ cfu/g and Fungi count ranged from $5 \times 10^4$ cfu/g to $15 \times 10^4$ cfu/g. Microorganism isolated were Staphylococcus spp, Salmonella spp, Bacillus spp, Pseudomonas spp, Escherichia coli, Rhizopus and Saccharomyces spp. In all the four samples, there was low fungi count, high Staphylococcus in sample D but lesser number of coliform count in sample A. The statistical analysis shows significant difference ($p>0.05$) in the analysis. Sample A and C contains more microbes than B and D apart from Staphylococcus. The analysis shows that the counts exceeded recommended limits for all the pathogens. Poultry meat obtained from these cold rooms should therefore be properly cooked to eliminate these pathogens in order not to pose health risks to the consumers.

Keywords: Microbial, Frozen, Poultry meat, Chicken, Turkey.

1. INTRODUCTION

Poultry is a category of domesticated birds kept by humans for the purpose of collecting their eggs, killing them for meat or for feathers. These most typical are members of the super order Galloansera (fowl) especially the others such as chicken, turkey and quails belong to order Galliformes and the family Anatidae (in order Passeriformes) (Jacob, (2015); Miranda et al., (2008)). The European community was banned from the use of antimicrobials as growth promoters in poultry farming in January, 2006 because of the risks of increased resistance (Miranda et al., 2008). Nigeria annually produces an average of 11,829 tons of chicken, but demand and imports of poultry meat into Nigeria has increased over the years. Hence, spending about 8 million US dollars to import chicken meat in 2005 alone (Alabi and Alabi, 2009).

Chicken (Gallus gallus domesticus) is a type of domesticated fowl/bird kept on a farm for its eggs or its meat. There are more chickens in the world than any other bird or domesticated fowls (Perry et al, 2015). The prevalence of chickens is due to almost the entire chicken being edible and the ease of raising them. In developed countries, chickens are usually subjected to intensive farming methods (Sims, 2003).

Turkey (Meleagris gallopavo) is a large bird grown for its meat on farms. The flesh of this bird used as food (Dickson, 2000). Turkey provides 20% of the world’s animal protein at a reasonable price. There are many firms supplying suitable housing and equipment designed for the best welfare of the birds and advances in veterinary research ensure that healthy stock is normal (Sherwin, 2010).

Poultry meat can be contaminated with variety of microorganism including those capable of causing illness due to mishandling of the carcasses of the birds which is of greatest global concerns in the respect, others present include the more recently reported Arcobacter and Helicobacter spp and occasionally, Verotoxigenic Escherichia coli. While poultry is by no means the only source of the causative organisms, it is widely recognized as a major reservoir in each case due to symptomless carriage in the live bird. The microbiological hazards are well known and are often difficult to control effectively because of the technological limitations in the process that can lead to cross contamination of the carcasses being processed. (Pooni and Mead, 1984)
The microbiological safety of poultry meat is equally important to producers, retailers and consumers and both involve microbial contaminants on the processed product. Two quite different groups of microorganisms are relevant: on the hand certain food borne pathogens and on the other hand, organisms that are generally harmless to human health but being psychotropic are able to multiply on the product during chill storage (Mead, 2004). Spoilage results mainly from “off-colour” development and product shelf-life is determined both by the number of organisms present initially and the temperature history of the product at all stages of production and subsequent storage and handling (Pooni and Mead, 1984; Chaiba et al, 2007). The importance of the study is to safeguard the health of the consumer to ensure that it does not contain pathogenic microbes and to ascertain the microbial load of the poultry meat. Therefore, the objective of the study is to determine the microbial count of frozen poultry meat (chicken and turkey) and to identify any pathogenic microbes in the poultry sample.

2. MATERIALS AND METHODS

Materials

Four samples of frozen poultry meat (chicken and turkey) were brought from two (2) cold rooms in Ilaro, Ogun State transported and stored aseptically in the laboratory before analysis

Sample Preparation

The frozen poultry meat was suspended in a known amount of sterile distilled water after mashing the samples aseptically using mortar and pestle. It was homogenized, then the samples were serially diluted under aseptic condition.

Microbial Analysis

Ten (10) grams of each poultry meat samples was diluted in 9 ml of sterile distilled water in a conical flask to get the aliquot, a tenfold serial dilution was carried out. An aliquot of 1 ml from selected dilutions of each sample was inoculated aseptically into labelled duplicate agar plates of media (Nutrient Agar for total viable count, MacConkey Agar for total coliform, Baird parker Agar for Staphylococcus count, Bismuth sulphite Agar for Salmonella count) using standard pour plate method and incubated at 35°C±2°C for 24 to 48 hours. Potato Dextrose Agar was incubated at 28°C±2°C for 3 to 5 days for isolation of fungi. Colonies were enumerated at the end of incubation period using digital colony counter (Gallenkamp England). (Lynne, 2003)

3. RESULTS AND DISCUSSION

Table 1: Microbial analysis of the frozen poultry meat samples sold in ilaro environs

<table>
<thead>
<tr>
<th>Sample</th>
<th>Total plate Count (cfu/g)</th>
<th>Coliform Count (cfu/g)</th>
<th>Staphylococcus Count (cfu/g)</th>
<th>Salmonella Count (cfu/g)</th>
<th>Fungi Count (cfu/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>57x10⁴</td>
<td>55x10⁴</td>
<td>7x10⁴</td>
<td>46x10⁴</td>
<td>5x10⁴</td>
</tr>
<tr>
<td>B</td>
<td>38x10⁴</td>
<td>20x10⁴</td>
<td>4x10⁴</td>
<td>16x10⁴</td>
<td>7x10⁴</td>
</tr>
<tr>
<td>C</td>
<td>39x10⁴</td>
<td>8x10⁴</td>
<td>7x10⁴</td>
<td>8x10⁴</td>
<td>14x10⁴</td>
</tr>
<tr>
<td>D</td>
<td>32x10⁴</td>
<td>7x10⁴</td>
<td>36x10⁴</td>
<td>13x10⁴</td>
<td>15x10⁴</td>
</tr>
</tbody>
</table>

Values are means of duplicate determination. Key: A – frozen chicken meat (raw) from Orita, B – frozen chicken meat (raw) from Town, C – frozen turkey meat (raw) from Orita, D – frozen turkey meat (raw) from Town
Table 2: Microorganisms isolated from the frozen poultry meat samples

<table>
<thead>
<tr>
<th>Sample</th>
<th>Isolated microorganisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Staphylococcus spp, Escherichia coli, Micrococcus sp, Streptococcus spp, Rhizopus spp</td>
</tr>
<tr>
<td>B</td>
<td>Staphylococcus spp, Escherichia coli, Micrococcus sp, Streptococcus spp, Saccharomyces spp, Lactobacillus spp</td>
</tr>
<tr>
<td>C</td>
<td>Staphylococcus spp, Bacillus spp, Salmonella spp</td>
</tr>
<tr>
<td>D</td>
<td>Salmonella spp, Staphylococcus spp, Escherichia coli, Rhizopus spp</td>
</tr>
</tbody>
</table>

Key: A – frozen chicken meat (raw) from Orita, B – frozen chicken meat (raw) from Town, C – frozen turkey meat (raw) from Orita, D – frozen turkey meat (raw) from Town

Table 3: Biochemical Test for Bacterial Isolation

<table>
<thead>
<tr>
<th>Suspected</th>
<th>Shape</th>
<th>Gram</th>
<th>Catalase</th>
<th>Oxidase</th>
<th>Coagulase</th>
<th>Motility</th>
<th>Urease</th>
<th>Indole</th>
<th>Sucrose</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus</em> sp</td>
<td>Rod</td>
<td>+ve</td>
<td>+ve</td>
<td>-ve</td>
<td>+ve</td>
<td>-ve</td>
<td>+ve</td>
<td>-ve</td>
<td>Acid/gas</td>
</tr>
<tr>
<td>Acid/gas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Streptococcus</em></td>
<td>Cocci</td>
<td>-ve</td>
<td>+ve</td>
<td>+ve</td>
<td>-ve</td>
<td>-ve</td>
<td>-ve</td>
<td>-ve</td>
<td>Acid/gas</td>
</tr>
<tr>
<td>Acid/gas</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Lactobacillus</em></td>
<td>Rod</td>
<td>+ve</td>
<td>-ve</td>
<td>-ve</td>
<td>-ve</td>
<td>-ve</td>
<td>+ve</td>
<td></td>
<td>Acid/gas</td>
</tr>
<tr>
<td>Acid/gas</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Staphylococcus</em></td>
<td>Cocci</td>
<td>+ve</td>
<td>+ve</td>
<td>-ve</td>
<td>-ve</td>
<td>+ve</td>
<td>+ve</td>
<td>+ve</td>
<td>Acid/gas</td>
</tr>
<tr>
<td>Acid/gas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Pseudomonas</em></td>
<td>Rod</td>
<td>-ve</td>
<td>+ve</td>
<td>-ve</td>
<td>+ve</td>
<td>+ve</td>
<td>+ve</td>
<td></td>
<td>Acid/gas</td>
</tr>
<tr>
<td>Acid/gas</td>
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</tbody>
</table>

4. DISCUSSION

Table 1 shows the result of the microbial analysis, it was observed that sample A contain \(7 \times 10^4\) cfu/g *Staphylococcus* sp, \(46 \times 10^4\) cfu/g *Salmonella*, \(55 \times 10^5\) cfu/g Coliform, \(57 \times 10^4\) cfu/g TPC and \(5 \times 10^4\) cfu/g for Fungi. Sample B contains \(38 \times 10^4\) cfu/g for TPC, \(4 \times 10^4\) cfu/g for *Staphylococcus* spp, \(16 \times 10^4\) cfu/g *Salmonella*, \(20 \times 10^4\) cfu/g Coliform and \(7 \times 10^4\) cfu/g Fungi. Sample C contains \(39 \times 10^4\) cfu/g TPC, \(7 \times 10^4\) cfu/g *Staphylococcus* spp, \(8 \times 10^4\) cfu/g *Salmonella*, \(8 \times 10^4\) cfu/g Coliform and \(14 \times 10^4\) cfu/g Fungi. The sample D was observed to contain \(32 \times 10^4\) cfu/g for TPC, \(36 \times 10^4\) cfu/g *Staphylococcus* spp, \(13 \times 10^4\) cfu/g *Salmonella*, \(7 \times 10^4\) cfu/g Coliform and \(15 \times 10^4\) cfu/g Fungi. Sample A contains more microorganisms except in the case of *Staphylococcus* spp in sample D which is very high. However, it was observed that sample C contains lesser microorganisms, then followed by sample B and A. The high level of microorganism in sample D could be due to contamination of the carcass during processing and handling. The result obtained in this study showed that the values observed is in agreement with the values reported by Iman *et al.*, (2015). Iman *et al* reported the total viable count to range from \(1.1 \times 10^2\) up to \(9.8 \times 10^{13}\) cfu/g for all frozen poultry product examined.

The organisms isolated in this study was *Salmonella* spp, *Staphylococcus* spp, *Escherichia. coli*, *Lactobacillus* spp, *Pseudomonas* spp, *Streptococcus* spp, *Bacillus* spp, *Rhizopus* spp and *Saccharomyces* spp. Nzovaneku *et al.*, (2010) reported that the absence of *E. coli* in poultry meat can be considered fit for human consumption there poultry meat from cold rooms should be properly cooked to denature toxin produced by the organism as well as the organism itself such that consumption will not pose health risks to human population.
ICMSF (International Commission for Microbiological Specification of Foods) recommended that the number of microbial count for poultry meats (frozen) must not exceed $5 \times 10^6$ for total plate count, $5 \times 10^2$ for *E. coli*, $5 \times 10^2$ for *Staphylococci*, and absence of *Salmonella* in 25g of the frozen poultry meat. Generally, frozen poultry products are safe at $5 \times 10^7$ as stated by ICMSF. Therefore, it can be deduced that this study revealed how unsafe frozen poultry meats are for consumption because number of organisms obtained exceeded the limits recommended.

5. **CONCLUSION**

In conclusion, the results obtained in this study showed that poultry meats (chicken and turkey) sold in the selected area contained number of microorganisms higher than the specified limits recommended by ICMSF (International Commission for Microbiological Specification of Foods). Therefore, it can be concluded that freezing temperature does not totally inhibit the growth of microorganisms in a frozen product although proper cooking would kill most of the microorganisms present. The growth of *Escherichia coli*, *Staphylococcus* and *Salmonella* is of great concern as this may pose health risk to the consumers.

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Production of off-flavour odours from poultry skin by bacterial isolates. pp. 22:35 6367
THE EFFECT OF TV VIEWING ON THE SOCIAL BEHAVIOUR OF CHILDREN RESIDENT IN IKOSI COMMUNITY AREA, ILARO

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ABSTRACT

Children can use media to increase their understanding of the world around them as well as learn positive social behaviours. A total of 50 questionnaires were administered and retrieved for computation. From the survey, there were more boys (64%) than girls (36%) from the pool of respondents, which were basically children. The majority of the respondents believe that the usual 9pm bedtime practice is old-fashioned, judging by the number; 26 that disagreed with it, while those who strongly agreed (18%) could have been from their strict moral belief in obedience to parents’ instructions. Some respondents opined that parental enforcement on the viewing of local programmes over foreign ones is considered an act of wickedness, as they find the local programmes quite boring (62%), even though they quite agreed that TV and other media technology should be used to develop themselves educationally, religiously and morally (88%). Despite the fact that the majority of the respondents (94%) disagreed that TV and other mass media technology are bad for children, 78% of them believe that children are easily carried away by what they watch and learn from these electronic media. It can be deduced that the children living in Ikosi Community Area, Ilaro, are not also immune to the social vices they may adopt from indiscriminate TV viewing and other mass media technology use but these can be curbed if the situation is properly managed and handled. Parents, in particular, should be saddled with the huge responsibility of parental supervision on the TV viewing length, programmes rating, and other mass media technology use by their children.

Keywords: Mass Media Technology, Programmes, Questionnaires, Survey, Social Vices

1. INTRODUCTION

Since television first appeared in the nation’s living rooms in the middle of the twentieth century, observers have voiced recurrent concern over its impact on viewers, particularly children. In recent years, this concern has extended to other electronic screen media, including computers and video game consoles. Although, researchers still have much to learn, they have provided information on the links between electronic media, especially television, and children’s learning and cognitive skills. With respect to development, what children watch is at least as important as, and probably more important than how much they watch.

The Collins English Dictionary (2010) defines media as communication, such as magazines and TV that reaches large numbers of people. These means of communication can be thought of as old types of media. New types of media are defined by Flew (2007) as those forms of communication that possess the qualities of being digitalized, compressible, interactive, manipulated, networkable and dense. Some examples of new media are the Internet, computers, video games and DVDs.

Children can use media to increase their understanding of the world around them as well as learn positive social behaviours. These benefits can last through to adolescence. Television viewing has been studied in children who are academically gifted, with results suggesting that selective viewing can promote academic abilities. Furthermore, parents of gifted children are more likely to see the potential benefits of educational TV programmes and make more selective viewing choices.

Video games involving information, academic content and problem solving have been shown to accelerate children’s learning. They can be particularly useful for children who have learning problems. Similarly, the array of information available on the internet is clearly able to broaden children’s knowledge and behavioural problems can occur in children of all ages, very often they start in early life (Carr, 2000).

Some children may even have serious behavioural problems such as physical fights, drug abuse, arson etc. Rutter and Taylor (2002) admit that there are behavioural problems when a child continues to behave badly for
several months or longer or if the behaviour is not ordinary and it seriously breaks the rules accepted in a family and community. These behavioural problems may be disruptive, delinquent and deviant. They opined that these sorts of behavioural problems can affect a child’s development and also interfere with his ability to live a normal life. In reference to the aforementioned, Reza and Mercy (2001) report that violence by young persons is one of the most visible forms of behavioural problems in human society. According to them, world newspapers and broadcast media report daily on violence by gangs in schools or young people on the streets. Electronic media, particularly television, have long been criticized for their potentially negative impact on children. One area for concern is how early media exposure influences cognitive development and academic achievement in children.

**Statement Of The Problem**

Some societal vices and problems have been attributed to some programmes on TV considered unsuitable for viewing by children. Parents’ lackadaisical attitude to viewing restriction, especially to programmes aired on cable TV, also calls for serious concern. Children’s vulnerability to want to watch what they watch, without proper guidance, could be attributed to their tendencies to want to be delinquents and menace to the society and the nation at large, children resident in Ikosi Community Area are no exception.

The objectives of this study are to determine;

1. What impact TV viewing has on development of children living in Ikosi.
2. How the children living in Ikosi respond to adverts and information from mass media technologies.
3. The effect TV programmes have on the development of children living in Ikosi.
4. The extent to which TV viewing affect the cultural values of children living in Ikosi.
5. The implications of the adoption of media technology by children living in Ikosi.

**Research Questions**

This study is guided by the following questions;

1. To what extent should children living in Ikosi be exposed to TV and other mass media technology?
2. To what extent has the children living in Ikosi’s exposure to TV and other mass media technology contributed to their development and upbringing?
3. What can be done to improve the positive roles of TV and other mass media technology on the upbringing of children living in Ikosi?
4. Are there any adverse impacts of TV and other mass media technology on the children living in Ikosi?
5. To what extent do TV and mass media technology influence the children living in Ikosi’s social behaviour?

**Significance Of The Study**

The significance of this investigation is that it sheds more light on the impact with which electronic media, particularly TV, have on the social interaction and behavior among the children living in Ikosi Community Area.

The result of this project work will enable their parents to better understand and be well acquainted with how to effectively use TV and other electronic media for the benefit of their children and the potential dangers that may arise from their abuse and parental negligence on their children’s TV viewing habit.

It could enable the government to educate the masses, especially parents, on the importance of parental control over TV viewing among children and stress the need to adhere to the age restriction/rating on programmes especially on cable TV. It could also encourage the government to use its broadcast instrument; the Nigerian Broadcasting Corporation (NBC), to censor, regulate, enforce and promote 70% local content among the licensed indigenous broadcast stations.
Conceptual Framework

Mass Media and Communication

To achieve the positive effects of mass media and technology on the upbringing of children, different methods are to be in place. Parents can select well-designed, age-appropriate programs and view the programs with their children to maximize the positive effects of educational media.

According to Wimmer and Dominick (2013), mass communication is any form of communication transmitted through a medium (channel) that simultaneously reaches a large number of people. Mass media are the channels that carry mass communication.

Types of Communication (Mass Media)

Communication has two types of relations which are stated as follows:

Direct or Interpersonal Communication: This is a type of communication which is produced between one or more persons situated nearby, that interacts and influences each other.

Indirect Communication: This type of relation is also between one or more persons that do not stand nearby, the communication between them is being mediated by a technical mean more or less complicated (letter, newspapers, books, telephone, radio, television, computer, internet) and is called indirect or mediated communication.

Theoretical Framework

There is no one single theoretical model that can be applied to explain the current state of knowledge. Therefore, two frameworks provide the theoretical foundation for this paper.

Social Learning Theory

Albert Bandura first developed the SLT in 1962. He theorizes that people learn by observing others and thought processes are key to understanding personality (Bandura, 1986). Knowledge is acquired through observation of models. Interpersonal relations or media sources can serve as models. SLT is useful to explain and predict the media effects of TV and video games, which positively correlates with violence and aggression (Olsen et al., 2009). This model assumes that constant exposure to a behavior, even if the result is negative, has great impact on expressed behavior.

Displacement Theory

Many researchers utilize the Displacement Theory (DT) to explain and guide research on the effects of media on children. Displacement Theory (DT) assumes that media use is a choice and that the greater amount of time children spends engaged with media, the less time that they have for other pursuits such as sports, schoolwork and social interaction. The results of this displaced activity are increased physical and psychosocial health risks.

EMPIRICAL STUDY

Wilson (2008) reviewed evidence of the link between media use and children's emotions, and explored how media affects social development. She analyzed over 110 articles published between 1963 and 2007. Her report revealed a good deal of evidence to suggest that media contributed to children's fear and anxiety especially in younger children. Those who viewed TV > 6 hours per day were more likely to have anxiety and depression. There was strong evidence of a positive correlation between violent TV programs and video games with aggressive behavior (Wilson, 2008). However, she found that educational programs and situation comedy targeted to youth increased altruism, cooperation, and tolerance. Wilson (2008) demonstrated that media effect “depends on the content to which the children are exposed” and is highly influenced by age, gender, race, home life, and temperament. Children's choice of media, identification with characters, modeling of behavior, and imprinting may the mechanisms by which children's behaviors were acquired. This lends support to Social Learning Theory and the Message Interpretation Process model.
2. METHODOLOGY

The methodology of this research work entails the research design, population of the study, sample and sampling techniques, method of data collection, questionnaire design and method of data analysis.

Research Design

A research design is a systematic approach that a researcher uses to conduct a scientific study. For the purpose of this research work, quantitative research design was used.

Sampling Technique

Probability Sampling Technique: It means that every individual in a population stands an equal chance of being selected, because probability sampling involves random selection, it assures that different subsets of the population have an equal chance of being represented in the sample. For the purpose of this research work, probability sampling techniques was used to select respondents; basically children, living within Ikosi Community Area, Ilaro.

Sample Size

A research population is generally a large collection of individual or object that is the main focus of a scientific query (Oze, 2007). Akinbo (2004) opines that a sample is a part or subset of the population carefully selected, observed and studied in order to make a generalization or inference about the whole population. The sample size of this study is 50, denoted by N = 50.

Method of Data Collection

Data collection is a process of collecting information from all the relevant sources to find answers to a research problem, and evaluate the outcomes.

Data collection for this study was done through the collection and collation of primary data from the respondents. The primary data were collected through the use of the questionnaire method and a few personal interviews conducted with some of the older respondents.

Questionnaire Design

According to Fagoyinbo (2014), a questionnaire is a quick and cheap method of conducting a survey. For the purpose of this research work, close ended questions were adopted. Out of the 100 questionnaires administered, 85 were retrieved and used for the analysis of this study.

Method of Data Analysis

Data analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate data. For easy understanding and interpretation, simple percentage method was used in analyzing these data and presented in tabular form.

3. RESULTS AND DISCUSSION

The purpose of this section is to present and analyze data that were generated from respondents.

Out of a total of 50 questionnaires administered, the entire 50, which depicts a 100% response rate, were retrieved for computation, over a 4-week period. This was achieved mainly because the investigation adopted an on-the-spot response technique in which the researcher waited as the respondents filled in the questionnaires after being guided and assisted as to how. The table below shows the demographic data of the respondents collectively.
Table 1: Demographic Data of the Respondents

<table>
<thead>
<tr>
<th>S/N</th>
<th>Sex</th>
<th>Age</th>
<th>Education</th>
<th>Tribe</th>
<th>Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>B</td>
<td>32</td>
<td>5 – 10 = 33 (66%)</td>
<td>Yoruba = 43</td>
<td>Broken = 3 (6%)</td>
</tr>
<tr>
<td></td>
<td>(64%)</td>
<td></td>
<td>Basic = 36 (72%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>G</td>
<td>18</td>
<td>11 – 16 = 17</td>
<td>Others = 7 (14%)</td>
<td>Intact = 47 (94%)</td>
</tr>
<tr>
<td></td>
<td>(36%)</td>
<td></td>
<td>Secondary = 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
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</tbody>
</table>

From the table, there were more boys (64%) than girls (36%) from the pool of respondents. The age bracket 5 – 10 had a higher percentage of 66% as compared to that of 11 – 16 with 34%. 72% of the respondents are basic school pupils while the remaining 14% are secondary school students. The majority of the respondents are Yoruba (43%) while just 14% are from other tribes which include Hausa, Igbo and Bini. 47% of the respondents are from intact homes with both parents still together while unfortunately, 6% are from broken homes with both parents either separated, or divorced.

Table 2: Frequency Table for the Respondents’ Answers to the Research Questions

<table>
<thead>
<tr>
<th>S/N</th>
<th>QUESTION</th>
<th>SA</th>
<th>A</th>
<th>SD</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Children’s bedtime should be 9pm</td>
<td>9 (18%)</td>
<td>11 (22%)</td>
<td>4 (8%)</td>
<td>26 (52%)</td>
</tr>
<tr>
<td>2.</td>
<td>Children should use TV and other mass media technology to better themselves educationally, religiously and morally</td>
<td>4 (8%)</td>
<td>44 (88%)</td>
<td>--</td>
<td>2 (4%)</td>
</tr>
<tr>
<td>3.</td>
<td>Parents should monitor and enforce more of local and educational contents viewing and consumption in their children</td>
<td>1 (2%)</td>
<td>12 (24%)</td>
<td>6 (12%)</td>
<td>31 (62%)</td>
</tr>
<tr>
<td>4.</td>
<td>TV and other mass media technology are bad for children</td>
<td>--</td>
<td>3 (6%)</td>
<td>--</td>
<td>47 (94%)</td>
</tr>
<tr>
<td>5.</td>
<td>Children love to imitate what they watch, learn and consume from TV and other mass media technology</td>
<td>5 (10%)</td>
<td>39 (78%)</td>
<td>--</td>
<td>6 (12%)</td>
</tr>
</tbody>
</table>

Keys: SA = Strongly agree, A = Agree, SD = Strongly disagree, D = Disagree

Table 2 shows the general knowledge of the respondents on what they think and believe about the impact of TV viewing and other mass media technology’s use in relation to how they socially behave and interact. From the interviews conducted, the majority of the respondents believe that the usual 9pm bedtime practice is old-fashioned, judging by the number; 26 (52%) that disagreed with it, while those who strongly agreed; 9 (18%) could have been from their strict moral belief in obedience to parents’ instructions. Some respondents opined that parental enforcement on the viewing of local programmes over foreign ones is considered an act of wickedness, as the find the local programmes quite boring; 31 (62%), even though they quite agreed that TV and other media technology should be used to develop themselves educationally, religiously and morally; 44 (88%). Despite the fact that the majority of the respondents; 47 (94%), disagreed that TV and other mass media technology are bad for children, 39 (78%) of them believe that children are easily carried away by what they watch and learn from these electronic media. Children tend to want to copy exciting scenes from TV, ranging from wrestling, dress and dance culture, the notion that the acquisition of money and cars are good signs of success and achievement, to wanting to practise the use of hard drugs, alcohol and sex as things to make them feel mature and accepted socially. Unfortunately, these images stick to their memories long enough to potentially induce some social vices and unacceptable social behaviours among vulnerable children.

The possible effects of media contents on children include both good and bad attitudes, it also both improve and cause decline in academic performance. All media of communication are intended for providing easy means of disseminating information to people, they can neither be adjudged good nor bad for children’s or adults’ use. Television is mean to transmit motion pictures for the purpose of entertainment and to meet the information needs of people, it cannot be adjudged good or bad for children because some educative programmes and enlightening programmes, which have been made to be entertaining, are transmitted via television, of which if children are allowed to view them, may boost academic performances and better their upbringing.

Contrary to the perception of some people that mass media do not have positive effects on children but rather teach them moral decadence, mass media is indeed a means of reaching out to heterogeneous people at a
specific point in time to disseminate vital information that may be of great benefit to them. Children could learn a lot of things from the mass media, especially from watching educative television programmes that will benefit.

4. CONCLUSION AND RECOMMENDATION

4.1 Conclusion

The influential power of mass media cannot be over emphasized as information can be disseminated to a large number of people per time. It is arguable that some individuals still believe that TV viewing and other mass media technology have negative impacts on the upbringing and social behaviour of children, as what are being watched and consumed leave lasting impression on their fragile minds and memories.

By this investigation, it can thus be deduced that the children living in Ikosi Community Area, Ilaro, are not also immune to the social vices they may adopt from indiscriminate TV viewing and other mass media technology use but these can be curbed if the situation is properly managed and handled.

4.2 Recommendations

Parents, guardians and media regulatory authorities only need to join hands to make sure that children are not exposed to media contents that could have negative effects on their reasoning and attitudes and interactions socially. Parents, in particular, should be saddled with the huge responsibility of parental/adult supervision (not necessarily strict) on the TV viewing length, programmes rating, and other mass media technology use by their children. They could also guide them by telling them that some programmes are for the purpose of entertainment and not to be actually mimicked or practised in real life.

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THE EFFECT OF ABO BLOOD GROUP CLASSIFICATIONS ON BIOCHEMICAL MARKERS OF HEALTHY ADULTS

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ABSTRACT

This study was aimed at evaluating the effect of ABO blood groups on liver function and lipid profile. A total of seventy (n=70) adult of both sexes were recruited into the study. All participants were assumed healthy provided they have not been on medication for a period of two weeks prior to their recruitment. Biochemical markers assessed includes liver function tests such as; albumin, aspartate aminotransferase (AST), alanine aminotransferase (ALT). Lipid profile such as cholesterol, triglyceride and low-density lipoprotein (LDL). Blood group O has the highest frequency of 42 %, while AB has the lowest frequency of 12.9 %. A significant positive correlation was seen between weight and BMI also a negative correlation was seen between total cholesterol and BMI. There was no significant difference in the levels of ALT and triglyceride. In the blood group A, results of the liver function test reveals that the activity of AST and albumin decreased significantly for the liver function test among the blood groups (p< 0.05). The level of blood total cholesterol increased significantly (p< 0.05) in blood group B; but decreased significantly in blood group A and AB (p< 0.05) among the blood groups for the lipid profile assay. These assays show significant differences within the ABO blood groups; this may be an indicator of health status with respect to ABO blood group based on the knowledge of what we know of polymorphisms, that individuals belonging to the different blood groups are not equally viable.

Keywords: Biochemical markers, ABO blood groups and healthy adult.

1. INTRODUCTION

The ABH histo-blood group antigens are a set of polymorphic and inherited glycoconjugate structures that are expressed on the cell surface of human erythrocyte (Amajadi, 2015). These blood groups are discovered by an Austrian biologist Landsteiner in 1901 (Landsteiner and Wiener, 1940). Later on, in 1939, Rhesus blood groups were discovered by Landsteiner and Wiener in 1940. Since 1901, more than 20 distinct blood group systems have been identified but the ABO and Rhesus blood groups remain clinically the most important (Rashaduz et al., 2015). The ABO and Rh blood groups are the most important blood groups so far (Eru et al., 2014). ABO blood group system is divided into four blood types on the basis of presence or absence of A and B surface antigens. The blood groups are A, B, O and AB. The frequency of four main ABO blood groups varies in the population throughout the world. ABO blood group system derives its importance from the fact that A and B are strongly antigenic and anti A and anti B (Rashaduz et al., 2015).

Despite their discovery in 1900, the critical role of ABO blood groups in transfusion medicine, and their apparent link to multiple diseases, the association of blood groups with mortality. Therefore, we decided to examine the hypothesis that blood groups are associated with overall and cause-specific mortality. Mortality and cancer in relation to ABO blood (Etemadi et al., 2015). There is a dearth of information on the ABO and Rhesus blood group distribution in Benue State North central region of Nigeria. The Major tribes in Benue State include Tiv, Idoma, Igede, and Jukuns however there are some other tribes that are few in number that live in the State, these include: Yourba, Hausa and Igbo.
2. MATERIALS AND METHODS

Subjects inclusion criteria

Adult males and females between the ages of 18 to 45 years old, who have not been on any medication in the past two weeks prior to blood collection and willingly gave consent to be part of the research work were included in the work.

Subjects exclusion criteria

Adults above the age of 45 years, children and teenagers were excluded from the research. Adults within the research age categories who are either on medication or unwilling to participate in the research were also excluded from the study.

Participants’ blood collection

Blood samples were obtained by venipuncture using vacutainers with heparin as anticoagulant. The blood samples were properly handled and retained in ice to prevent lysis. The samples were refrigerated and immediately transported to the laboratory. The vacuum blood gathering tube was instantly centrifuged at 3000rpm for 10 minutes at room temperature. The sample plasma was aliquoted into labeled Eppendorf tubes and stored at -80°C. The plasma was used to quantify biochemical, liver function test and lipid markers in the blood.

Lipid Profile Tests

Cholesterol

Principle

The cholesterol esters of the sample are hydrolyzed by cholesterol esterase. 4-Cholesten-3-one and H2O2 are then formed from the released free cholesterol by cholesterol oxidase. A measurable red quinoneimine derivative, that has an absorbance at 500 nm, is formed from hydrogen peroxide (H2O2) and 4-amino-antipyrine in the presence of phenol and peroxidase.

Elevated levels of cholesterol increase the risk for coronary heart disease (CHD). Cholesterol is measured to help assess the patient's risk status and to follow the progress of patient's treatment to lower serum cholesterol concentrations. Desirable cholesterol levels are considered to be those below 200 mg/dL in adults and below 170 mg/dL in children.

Reagents compositions

- Cholesterol buffer solution (Cholesterol kit, 100 mL) - phenol 132 mg, NaH2PO4 0.78g, NaH2PO4 0.71 g.
- Enzyme reagent (Cholesterol kit, 100 mL dilution) - cholesterol oxidase 12 unit, cholesterol esterase 3.5 unit, peroxidase 6700 unit, 4-aminantipyrine 17.0 mg/dL.
- Cholesterol standard solution (Cholesterol kit) - 300mg/dL.

Procedure

- For blank preparation 1.5ml of the enzyme solution and 0.01ml of distilled water was prepared
- For standard preparation 1.5ml of the enzyme solution and 0.01ml of the standard solution was prepared
- Sample preparation contained the mixture of 1.5ml of the enzyme solution and 0.01ml of the serum solution
Calculation:

Absorbance of Sample

\[
\text{Cholesterol Level (mg/dL) } \times 300 \\
\text{Absorbance of Standard}
\]

Triglyceride

Principle

Triglycerides are measured enzymatically in serum or plasma using a series of coupled reactions in which triglycerides are hydrolyzed to produce glycerol. Glycerol is then oxidized using glycerol oxidase, and \( \text{H}_2\text{O}_2 \), one of the reaction products, is measured as described above for cholesterol. Absorbance is measured at 500 nm. The reaction sequence is as follows:

\[
\text{Lipase} \\
\text{Glycerokinase} \\
\text{Glycerol-3-phosphate oxidase} \\
\text{Peroxidase}
\]

High levels of serum triglycerides help mark conditions that are associated with increased risk for CHD and peripheral atherosclerosis. High triglycerides are associated with increased risk for CAD in patients with other risk factors, such as low HDL-cholesterol, some patient groups with elevated apolipoprotein B concentrations, and patients with forms of LDL that may be particularly atherogenic. Desirable fasting triglyceride levels are considered to be those below 200 mg/dL, and are further categorized as Borderline, 200-400 mg/dL; High, 400-1,000 mg/dL; and Very High (> 1000 mg/dL). Very high triglycerides can result in pancreatitis and should be promptly evaluated and treated. Triglycerides are also measured because the value is used to calculate low density lipoprotein (LDL)-cholesterol concentrations.

Procedure

1. Reagent blank was prepared by pipetting 1000µ into a test tube
2. Standard was prepared by adding 10µ to 1000µ.
3. Sample was prepared by adding 10µ of serum to 1000 µ of the reagent.
4. The preparations were Mixed, incubate for 10 minutes at 20-25°C.
5. The absorbance of the sample (Asample) and standard (Astandard) was measured against the reagent blank at within 60 minutes.

Low Density Lipo-Protein (Ldl)

Principle

Low density lipoprotein in the sample precipitate with polyvinyl sulphate. Their concentration is calculated from the difference between the serum total cholesterol and the cholesterol in the supernatant after centrifugation. The cholesterol is spectrophotometrically measured by means of coupled reactions described below.

Cholesterol esters + H2O \text{Cholesterol esterase} \text{Cholesterol} + \text{fatty acid}

LDL-cholesterol

Most of the circulating cholesterol is found in three major lipoprotein fractions: very low-density lipoproteins (VLDL), LDL and HDL.

\[
\text{[Total chol]} = \text{[VLDL-chol]} + \text{[LDL-chol]} + \text{[HDL-chol]}
\]

LDL-cholesterol is calculated from measured values of total cholesterol, triglycerides and HDL-cholesterol according to the relationship:

\[
\text{[LDL-chol]} = \text{[total chol]} - \text{[HDL-chol]} - \text{[TG]}/5
\]
Where \([\text{TG}/5]\) is an estimate of VLDL-cholesterol and all values are expressed in mg/dL. LDL carries most of the circulating cholesterol in man and when elevated contributes to the development of coronary atherosclerosis. LDL-cholesterol is measured to assess risk for CHD and to follow the progress of patients being treated to lower LDL-cholesterol concentrations. Desirable levels of LDL-chol are those below 130 mg/dL in.

Procedure: A
1. The following was pipette into labelled centrifuge tubes; 100µ of sample and 100µ of the cholesterol kit (polyvinyl sulphate 3 g/L, polyethyleneglycol 3 g/L).
2. The mixture was mixed thoroughly and let stand for 15 minutes at room temperature
3. It was centrifuge at a minimum of 4000 r.p.m for 15 minutes.
4. Then the supernatant was carefully collected

Procedure: B
1. The reagent blank was 20µ of distilled water
2. In other labelled tubes; 20µ was pipetted.
   - The total mixture was mixed thoroughly and incubate the test tubes for 30 minutes at room temperature (16-25°C).
   - The absorbance of the standard and sample was read at 500nm against the blank.

Calculations
\[
\text{LDL Cholesterol} = \frac{\text{A sample} \times C \times \text{sample dilution factor}}{\text{A standard}} \times \text{Sample dilution factor} - \text{Cholesterol in supernatant}
\]

Liver Function Test
Alanine Aminotransferase (Alt)

Principle

Summary Of Test Principle And Clinical Relevance
In this reaction, an enzymatic rate method is used to measure ALT activity in serum. In this reaction, ALT catalyzes the reversible transamination of L-alanine and \(\alpha\)-ketoglutarate to pyruvate and L-glutamate. The pyruvate is then reduced to lactate in the presence of lactate dehydrogenase (LDH) with the concurrent oxidation of NADH to NAD. The system monitors the rate of change in absorbance at 340 nm over a fixed-time interval. The rate of change in absorbance is directly proportional to the ALT activity in the sample.

Alanine Aminotransferase (ALT), also known as serum glutamic-pyruvic transaminase (SGPT), is a pyridoxal-phosphate-dependent enzyme that catalyzes the reversible transfer of an amino group from alanine to \(\alpha\)-ketoglutarate, generating pyruvate and glutamate. ALT is found primarily in liver and serum, but occurs in other tissues as well. Hepatocellular injury often results in an increase of serum ALT levels and serum ALT levels can be used as a marker for liver injury. The ALT Activity Assay Kit provides a simple and direct procedure for measuring ALT activity in a variety of biological samples. ALT activity is determined by a coupled enzyme assay, which results in a colorimetric (570nm)/fluorometric (\(\lambda_{ex} = 535/\lambda_{em} = 587\) nm) product, proportional to the pyruvate generated. One unit of ALT is defined as the amount of enzyme that generates 1.0 \(\mu\)mole of pyruvate per minute at 37°C.

Procedure
To label test tubes were 0.05ml of the sample and 3.00ml of the reagent pipetted
   - The reaction Mixture, was read at initial absorbance and start timer simultaneously. Read again after 1, 2 and 3 min.
Aspartate Aminotransferase (AST)

Principle
This reaction uses enzymatic rate method to measure the AST activity in serum or plasma. In the reaction, the AST catalyzes the reversible transamination of L-aspartate and α-ketoglutarate to oxaloacetate and L-glutamate. The oxaloacetate is then reduced to malate in the presence of malate dehydrogenase with the concurrent oxidation of NADH to NAD.

Procedure
To label test tubes were 0.05ml of the sample and 3.00ml of the reagent pipetted

- The reaction mixture was read at initial absorbance and start timer simultaneously. Read again after 1, 2 and 3 min.

Albumin
Albumin is a protein that is formed in the liver. Approximately 50-60 % of total protein is albumin, the rest is globulin. The albumin helps to maintain normal distribution of water in the body (colloidal osmotic pressure), and also helps in the transport of blood constituents such as ions, pigments, bilirubin, hormones, enzymes, and drugs. The ratio of albumin to globulin is an important indicator of certain disease states. Albumin level is decreased in several liver diseases, malabsorption, diarrhea, eclampsia and nephrosis. The level is increased in dehydration.

Clinical Significance
Albumin is the most abundant serum protein representing 55-65% of the total protein. It is synthesized in the liver and has a half-life of 2 to 3 weeks. The main biological functions of albumin are to maintain the water balance in serum and plasma and to transport and store a wide variety of ligands e.g. fatty acids, calcium, bilirubin and hormones such as thyroxine. Albumin also provides an endogenous source of amino acids. Hypoalbuminaemia is associated with the following conditions: analbuminaemia; impaired albumin synthesis in the liver; liver disease; malnutrition or malabsorption; generalised shock; burns or dermatitis; kidney disease and intestinal disease. Hyperalbuminaemia has little diagnostic relevance except, perhaps in dehydration.

Principle
At pH=4.2, albumin bind with bromocresol green (BCG) to produce a blue-green complex. The change in absorbance at 628 nm correlates with the concentration of albumin.

Procedure
1. The following were pipetted into labelled tube 0.01 and 3.00ml of working reagent. This represents the blank.
2. To another test tube was added 0.01ml of the standard reagent. This represents the standard.
3. To another test tube was 0.01 ml of serum and 3.00ml of reagent added.

Calculation

\[
\text{Albumin Concentration (g/l or g/dl)} = \frac{A_{\text{sample}} \times \text{Concentration of standard}}{A_{\text{standard}}}
\]

3. STATISTICAL ANALYSIS

Data are presented as mean ± standard error of mean (S.E.M). Statistically significant differences in mean values were tested by one-way analysis of variance (ANOVA). The data were analyzed using Statistical Package of Social Sciences 22.0.0.0 (SPSS Inc. 2014) and Microsoft excel 2017 version. The differences were considered significant when p<0.005.
4. RESULTS

Effect of anthropometric parameters on Abo blood groups
Participants enrolled in this study were young adult from age 18-45 years old. The characteristics of studied groups informed from the questionnaire were presented in table (Table 1). There was no significant difference between and within the groups with respect of their height, weight and the Body mass index (BMI).

Table 1: Effect of blood group classification on anthropometric parameters.

<table>
<thead>
<tr>
<th>BLOOD GROUP</th>
<th>FREQUENCY OF OCCURRENCE</th>
<th>PERCENTAGE FREQUENCY (%)</th>
<th>WEIGHT (KG)</th>
<th>HEIGHT (M)</th>
<th>BMI (K/M²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>30</td>
<td>42</td>
<td>67.43±1.5</td>
<td>1.67±0.1</td>
<td>25.39±1.5</td>
</tr>
<tr>
<td>A</td>
<td>11</td>
<td>15</td>
<td>74.09±5.4</td>
<td>1.67±0.1</td>
<td>27.14±2.0</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
<td>28</td>
<td>70.62±3.4</td>
<td>1.64±0.1</td>
<td>27.38±2.0</td>
</tr>
<tr>
<td>AB</td>
<td>8</td>
<td>15</td>
<td>65.12±8.0</td>
<td>1.58±0.1</td>
<td>28.65±7.1</td>
</tr>
</tbody>
</table>

The values are expressed as mean ± standard error of mean (SEM).

Effect of liver function tests on Abo blood groups
The table 2, represents the results of the liver function test. in this table AST and albumin test show significant difference among the ABO blood group, but that of Alanine transaminase (ALT) shows no significant difference for all the groups with respect to the blood types.

TABLE 2: Effect of blood group classification on liver function markers

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>O</th>
<th>A</th>
<th>B</th>
<th>AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY</td>
<td>30</td>
<td>11</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>AST (U/L)</td>
<td>50.24 ± 5.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>11.81 ± 2.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>26.60 ± 4.3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>18.25 ± 4.8&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>ALT (U/L)</td>
<td>19.93 ± 3.5</td>
<td>12.72 ± 5.8</td>
<td>23.95 ± 6.8</td>
<td>33.25 ± 12.0</td>
</tr>
<tr>
<td>ALBUMIN (G/L)</td>
<td>10.23 ±1.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.15 ± 1.4&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.30 ± 0.5&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.37 ± 1.5&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

The values are expressed as mean ± standard error of mean (SEM) of the liver function test as indicated in the table 2. AST means aspartate aminotransferase and ALT means alanine transaminase; albumin test show significant difference among the ABO blood group. Superscript a ‘<sup>a</sup>’ and b ‘<sup>b</sup>’ indicates values that are significantly (p<0.05) different from each other.

Effects of lipid profile assays on abo blood groups
In the table 3, it was represented here that the cholesterol assay shows a significant difference among the ABO blood group. Also, low density lipo-protein also shows significant difference among the blood groups. There is no significant difference among the ABO blood group for triglyceride assay.

TABLE 3: Effect of blood group classification on lipid profile

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>O</th>
<th>A</th>
<th>B</th>
<th>AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY</td>
<td>30</td>
<td>11</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>CHOLESTEROL (mg/dl)</td>
<td>301.53 ± 6.9</td>
<td>244.11 ± 42.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>349.20 ± 21.5&lt;sup&gt;b&lt;/sup&gt;</td>
<td>350.20 ± 40.1&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>TRIGLYCERIDE (mg/dl)</td>
<td>216.67 ± 19.7</td>
<td>238.43 ± 45.9</td>
<td>240.57 ± 69.4</td>
<td>171.17 ± 9.2</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>272.63 ± 13.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>201.18 ± 27.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>313.45 ± 25 .1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>202.00 ± 46.5&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

1st National Conference of WITTED, Ilaro Chapter
5. DISCUSSION

Reports on the ABO blood groups have proven a lot about the implication of the different blood types. ABO blood group system, a well-known genetic risk factor, has clinically been demonstrated to be linked with thrombotic vascular diseases (Zhou et al., 2016). There is also abundant evidence that blood groups play a role in the susceptibility or resistance to various infectious and non-infectious diseases (Mourant et al., 1978). Some examples of associations between ABO blood group and disease are; haemolytic disease of the newborn, leukaemia, cancer, acquired B resulting from bacterial infection, and leucocyte adhesion deficiency type II (Geoff, 2002). However, the relationship between ABO blood group; liver function and lipid profile are still controversial and this is worthy to be assessed scientifically and strictly. In this study Blood group O has the highest frequency of 42 %, with female as 22 % and male as 20 % while AB has the lowest frequency of 12.9 %, with female as 7 % and male 5.7 %. Predominance of O and A blood group followed by B groups were observed (Roy et al., 2015). It was also observed in the course of this study that the blood group O is the commonest and blood group AB the rarest of the ABO blood group types. Blood group O is common, Blood group AB is the least common (Claudia, 2014). Roy et al., (2015) also corroborates this fact by showing in his work that O blood group was most common followed by A, B and AB.

The present study was conducted to satisfy two objectives: Assess the effect of ABO blood groups on lipid profile of healthy individuals, assess the effect of ABO blood groups on liver function markers of healthy individuals, and assess the effect of ABO blood groups on human anthropometry. There was no significant difference in the levels of ALT and triglyceride. This indicates that blood group doesn’t confer levels or cannot be used as a determinant for these biochemical parameters.

Abo Blood Group Relationship Between Anthropometric Data Among The Participants

This study, anticipated to explore any possible association between levels of laboratory findings of renal patients and blood groups. There was no significant difference between and within the groups as regards the anthropometric data which are the height, weight and the Body mass index (BMI). However, these results are inconsistent with some of the previous studies. In 2014 Maninder showed in a research work that participants with blood group O were heavier (64.78kg) followed by females with blood group AB (62.21kg), blood group A (60.88 kg) and then blood group B (60.21kg). Those with blood groups B or AB tended to be slightly lesser in number than those with blood A. Subjects with the B allele were either shorter or of equal height to group A (Kark et al.,2008). There was no association noted between BMI and ABO blood group (Elham, et al., 2012). This research of Elham, corroborates the result of this study.

Abo Blood Group Relationship With Liver Enzymes Activity Among The Participants

The findings of this study are in line with the work of Hisham and Hind (2010). Hisham and Hind (2010), reported that there was no significant relationship between the activities of ALT amongst ABO blood groups in Cohort of healthy blood donors and volunteers from Saudi Arabia. Although the reason was not been addressed (Hisham and Hind, 2010). The activity of AST and albumin decreased significantly for the liver function test among the blood groups (p< 0.05) in blood group A. This result shows that ABO blood group variations may have an influence on some liver enzymes activity of serum and also that the plasma concentration of these enzymes can be useful to access the function of the liver viability and its disease conditions Atsaboghena et al. (2013). The liver is the largest solid organ and plays a major role in metabolism with numerous functions in the human body. ALT and AST are critical enzymes in the biological processes. The synthesized ALT and stored AST changes in serum levels have become diagnostic tools and markers for assessing the liver function. Reports have suggested that their levels increase in different hepatic injuries, such as hepatitis and cirrhosis induced by alcohol, drugs, viruses, and also under oxidative stress. (Shu-Lin et al., 2016).

Serum aminotransferases are sensitive markers of hepatocellular injury (Tinsay et al., 2014). Liver function tests (LFT) are a helpful screening tool, which are an effective modality to detect hepatic dysfunction (Thapa and Anuj, 2007). Liver and kidney are exposed to a lot of oxidant substances that are both from exogen and endogen sources (Ragp et al., 2008). In the year 2015 Samar et al., showed that Albumin level was at peak B blood group renal patients. Serum aminotransferase levels ALT and AST are two of the most useful measures of liver cell injury. Lesser degrees of ALT level elevation may occasionally be seen in skeletal muscle injury or even after vigorous exercise. Oxidative stress and inflammation could also lead to damaged liver cells (Shu-Lin et al.,
2016). However, recent studies have shown that the upper limit threshold of ALT level should be lowered because people who have slightly raised ALT levels that are within the upper limit of normal (35-40 IU/L) are at an increased risk of mortality from liver disease. The two most common forms of autoimmune liver disease are autoimmune chronic hepatitis. Ninety percent of those with each disorder are women. Autoimmune hepatitis (AIH) is characterized by very high serum aminotransferase (ALT and AST) levels autoimmune hepatitis (AIH) is characterized by very high serum aminotransferase (ALT and AST) levels (Arvind, 2014).

Abo Blood Group Relationship with Lipid Profile Among The Participants
It is well established that ABO blood group is associated with cholesterol metabolism. (Li et al., 2015) The relationships between ABO blood groups and cholesterol levels have been established but differ in many studies (Gali et al., 2009). The level of blood total cholesterol increased significantly (p< 0.05) in blood group B; but decreased significantly in blood group A and AB (p< 0.05) among the blood groups for the lipid profile assay. High serum cholesterol is strongly implicated in the development of cardiovascular diseases. In this study cholesterol assay shows a significant difference among the ABO blood groups. Gali et al., 2009 showed in their work that there is a level of significance between serum cholesterol blood groups. Also, low density lipo-protein also shows significant difference among the blood groups. There is no significant difference among the ABO blood group for triglyceride assay. This was inconsistent with the work of Contiero et al., 1994. In the population studied we did not find any association between total, HDL- and LDL-cholesterol and ABO blood groups while triglyceride levels were higher in individuals with B antigen (B + AB) than in subjects without this antigen. Environmental factors could be more important than genetic factors in the arousal of cardiovascular diseases (Contiero et al., 1994). Individuals with blood group A seem more liable to develop atherosclerosis than those with blood group "non-A". Horby et al., (1989)

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion
This present study shows the evidence of links between the ABO blood group and the liver viability as regards the liver function test and lipid profile. It is been deduced in this research work that there are no relationship or effect of blood group on human anthropometry. Further experimental studies are also needed to unravel the molecular mechanisms linking ABO blood type, to the various maladies that has been unraveled in this study. ABO blood typing may hence become part of a multifaceted strategy for cancer risk assessment. There are no previous studies that has investigated the variations of biochemical tests by blood groups to compare our findings with, and accordingly this study presents a new piece of knowledge that may participate in future studies.

6.2 Recommendations
- Further research should be carried out to help establish these realized intriguing relationships that actually exist between the ABO blood group and the various markers assayed for.
- The following up of the individuals used as subjects for this research as regards the findings is important.
- Notwithstanding, this research indicates the need for more specific definition of liver viability and biochemical biomarkers of healthy individuals among adults that are young and this will lead ultimately to take more accurate diagnosis.
- This research work gives a new piece of knowledge which can part in future researches.

REFERENCES


PERFORMANCE CHARACTERISTICS OF GOATS FED COCOA SEED (*Theobroma cacao*) TESTA AS A REPLACEMENT FOR PALM KERNEL CAKE CONCENTRATE SUPPLEMENT TO BASAL GRASS (*Cynodon nlemfuensis*)

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ahmed.akinola@federalpolyilaro.edu.ng; olusola.leramo@federalpolyilaro.edu.ng

ABSTRACT

Twelve West Africa dwarf goat 15-16 months with an average weight of 16.5 kg were randomly allocated to three concentrates diets such that 0%, 50%, 100% of palm kernel cake were replaced with cocoa seed testa. Each of the 3 groups was reared on any of the concentrate supplements fed to a basal diet of grass *Cynodon nlemfuensis*. The experiment lasted for seven weeks including 2 weeks for adjustment of the animals to the cages. The data generated voluntary dry matter intake, weight gain and nutrient digestibility were subjected to one way ANOVA. Multiple range test was used to separate the means. Changes in body weight of group B had the highest mean with treatment that contained 50% CST replacement and the lowest was group A recorded from the diet with 0% CST replacement. The total voluntary dry matter intake (g/d/kg<sup>0.75</sup>) followed a similar trend as the feed conversion ratio in group B had the highest mean with treatment that contained 50% CST replacement while the lowest was group A with treatment that contain 0% CST replacement. Total dry matter intake (g/d) had the highest mean at group B with the treatment that contained 50% CST replacement while the lowest was group A with the treatment that contained 0% CST replacement. In conclusion, incorporation of the CST at 50% level of replacement of PKC enhanced the performance and nutrient digestibility of the West African Dwarf goat.

1. INTRODUCTION

The long term survival of animal production in Nigeria depends to a large extent on ability to provide adequate feed materials in the right quantity and quality for animal intake (Ettu and Onwuka, 2014). The population of goat is next to poultry in Nigeria. They are more prolific than cattle and are more hardy than sheep within the tropics. Cocoa seed testa is a by-product of Cocoa processing industries in Nigeria (Lagos and Ile - Olujji, Ondo State). The products are either set on fire or allowed to rot away.

Cocoa seed testa (CST) is usually allowed to waste anyway. The crude protein content is close to that of palm kernel cake (PKC) a tested agro-industrial by-product in animal production. If CST is duly evaluated through animal feeding, it can be encouraged as a feedstuff and so be an alternative to one of the conventional feed stuff.

Nutritional evaluation of CST will contribute to the existing knowledge on utilization of lesser known agro-industrial products and the pool of digestible nutrients in these products.

There is need to harness energy available in agriculture waste and agro – industrial by – products for livestock feeding after a nutritional evaluation which would lower the cost of production without sacrificing efficiency in livestock production.

2. MATERIALS AND METHODS

Twelve West African Dwarf bucks, 15-16 months and weighing 16 to 17kg were randomly divided into three groups of 4 per group. Each was kept in individual metabolic cage modified for separate collection of faeces and urine. They had access to feed and clean water daily. They were certified free from ecto and endo-parasites through veterinary services.
Table 1: composition (g/100g) of feed stuffs fed to the West African goats.

<table>
<thead>
<tr>
<th></th>
<th>Cocoa seed testa</th>
<th>Palm kernel cake</th>
<th>Maize offals</th>
<th>Grass (cynodon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude protein</td>
<td>18.0</td>
<td>17.7</td>
<td>6.0</td>
<td>8.6</td>
</tr>
<tr>
<td>Crude fiber</td>
<td>19.0</td>
<td>18.0</td>
<td>15.0</td>
<td>21.0</td>
</tr>
<tr>
<td>Ether extract</td>
<td>8.0</td>
<td>11.0</td>
<td>5.1</td>
<td>6.0</td>
</tr>
<tr>
<td>Ash</td>
<td>7.8</td>
<td>8.2</td>
<td>5.8</td>
<td>5.0</td>
</tr>
<tr>
<td>NFE</td>
<td>47.2</td>
<td>45.1</td>
<td>68.1</td>
<td>59.4</td>
</tr>
<tr>
<td>Gross-energy kcal/g DM</td>
<td>4.2</td>
<td>5.6</td>
<td>4.0</td>
<td>3.5</td>
</tr>
</tbody>
</table>

2.1 Experimental Diets

- Three isonitrogenous and isocaloric concentrate diets were formulated such that 0%, 50%, 100% of palm kernel cake (PKC) was replaced with cocoa seed testa (CST).
- Each of the 3 groups of goats was reared on any of the concentrate supplements fed to a basal diet of grass *Cynodon dactylon*.
- Weighed quantities of the chopped grass and supplement were offered daily at 08:00 *ad libitum*. Any residue was weighed to obtain voluntary intake. Each animal was also weighed once a week. The experiment lasted for seven weeks including 2 weeks for adjustment of the animals to the cages.

Table 2. Proximate composition (g/100g DM) of the concentrate supplement fed to goats.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize offals</td>
<td>59.0</td>
<td>59.0</td>
<td>59.0</td>
</tr>
<tr>
<td>Cassava flour</td>
<td>10.0</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Palm kernel cake</td>
<td>30.0</td>
<td>15.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Cocoa seed testa</td>
<td>-</td>
<td>15.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Mineral/Vitamins premix</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Common salt</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

2.2 Collection Of Faeces

At week 7 of the experiment total faecal output was measured daily 10% of the total was saved in a polythene bag for each animal and taken to the laboratory for drying in the oven. Dried fecal samples were collected for each animal for 6 days and were bulked and kept for analysis.

2.3 Analytical Procedure

Samples of faeces, CST, grass were dried (for DM), then ground through 0.2 mm sieve in a hammer mill. Accurately weighed quantities were analyzed for CP, CF, EE, and Ash using AOAC (2010) procedure. The gross energy (kcal/g DM) was determined with ballistic bomb calorimeter. The results so obtained were used for calculation of digestibility of CP, CF, EE, Ash and gross energy.

2.4 Statistical Analysis

The experiment was carried out in three treatments and four replications. The data collected were subjected to analysis of variance (ANOVA). If significant, multiple range test as outlined by Duncan (1955) was used to rank the treatment means.
3. RESULT AND DISCUSSION

Voluntary Dry Matter Intake

The summary of the dry matter intake is shown in Table 2.

The voluntary dry matter intake (g/day) varied from 849-862. The variations were significant (p<0.05) as goats in group B recorded the highest. The value then declined due to the inability of the animals to utilize or handle the anti-nutritional factor (theobromine) in group C. The values 849-862 however conformed to ARC (1910) recommendation which stated that goats would require 3% of their body weight as DM for maintenance and 5% for growth and maintenance.

Minimum of 50% of the VDMI came from the supplement. This suggested that the animals would accommodate up to 50% of replacement with CST. Beyond this value, there was a decline in intake.

**Table 3 Voluntary dry matter intake of WAD goats fed varying level of CST based concentrate to basal grass**

<table>
<thead>
<tr>
<th>S/N</th>
<th>A (g/day)</th>
<th>B (g/day)</th>
<th>C (g/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>832.5</td>
<td>891.0</td>
<td>855.0</td>
</tr>
<tr>
<td>2</td>
<td>837.0</td>
<td>877.5</td>
<td>868.5</td>
</tr>
<tr>
<td>3</td>
<td>855.0</td>
<td>877.5</td>
<td>873.0</td>
</tr>
<tr>
<td>4</td>
<td>873.0</td>
<td>859.5</td>
<td>855.0</td>
</tr>
<tr>
<td>MEAN</td>
<td><strong>849.38</strong></td>
<td><strong>876.38</strong></td>
<td><strong>862.88</strong></td>
</tr>
<tr>
<td>±SEM</td>
<td>9.2542</td>
<td>6.46263</td>
<td>4.63849</td>
</tr>
</tbody>
</table>

**VOLUNTARY DRY MATTER (g/d/kg w0.75)**

Table 3 depicts a summary of VDMI expressed per unit metabolic cage. The apparent variations 98.56-98.81 were significant (p<0.05) as goats in group B recorded the highest. The value then declined as a result of anti-nutritional factor (theobromine). Hence with this yard stick, the data suggested that PKC could be replaced up to 100% with CST in a diet fed to goats as supplement to grass. Metabolic size of any living organism is the body weight raised to power 0.75 (kg w0.75). This metabolic size provides a yard stick for comparison of voluntary dry matter intake (VDMI) (or metabolic activities) of a mouse with an elephant.

**Table 4 Voluntary dry matter (g/d/kg w0.75) of WAD goats feed varying levels of CST based concentrate to basal grass.**

<table>
<thead>
<tr>
<th>S/N</th>
<th>A (g/d/kg w0.75)</th>
<th>B (g/d/kg w0.75)</th>
<th>C (g/d/kg w0.75)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>98.17</td>
<td>99.11</td>
<td>98.62</td>
</tr>
<tr>
<td>2</td>
<td>98.35</td>
<td>100.40</td>
<td>98.92</td>
</tr>
<tr>
<td>3</td>
<td>98.62</td>
<td>100.40</td>
<td>99.09</td>
</tr>
<tr>
<td>4</td>
<td>99.09</td>
<td>99.59</td>
<td>98.62</td>
</tr>
<tr>
<td>MEAN</td>
<td><strong>98.56</strong></td>
<td><strong>99.88</strong></td>
<td><strong>98.81</strong></td>
</tr>
<tr>
<td>±SEM</td>
<td>0.20014</td>
<td>0.31855</td>
<td>0.11643</td>
</tr>
</tbody>
</table>

**CHANGES IN BODY WEIGHT**

Changes in body weight are summarized in Table 4.

The values of body weight ranged from 69.30-70.36g. The variations were significant (p< 0.05) as goats in group B recorded the highest with an average daily weight gain of 83.57g. It is measured to infer that beyond 50% replacement of PKC with CST, the goats recorded a decline in weight gain which was significant but highest (p<0.05) than the mean value (69.30g) for goats on the control (0% CST) diet.
Table 6: Variation in body weight gain obtained for the WAD goats fed varying level of concentrate supplement to basal grass.

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>S/N</td>
<td>0%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>1</td>
<td>71.42</td>
<td>80.00</td>
<td>71.43</td>
</tr>
<tr>
<td>2</td>
<td>68.57</td>
<td>85.71</td>
<td>71.42</td>
</tr>
<tr>
<td>3</td>
<td>68.60</td>
<td>85.71</td>
<td>68.57</td>
</tr>
<tr>
<td>4</td>
<td>68.60</td>
<td>82.86</td>
<td>70.00</td>
</tr>
<tr>
<td>MEAN</td>
<td>69.30a</td>
<td>83.57b</td>
<td>70.36c</td>
</tr>
<tr>
<td>± SEM</td>
<td>0.70754</td>
<td>1.36651</td>
<td>0.68326</td>
</tr>
</tbody>
</table>

a,b,c= means along the same row with any identical superscript are with significance (p>0.05)

SEM= Standard Error of Means

4. CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The bulk of evidence obtained from voluntary dry matter intake (g/kg$^{0.75}$) digestibility of nutrients (except DM) seemed to support the fact that 100% of dietary PKC could be replaced with CST. Results from weight gains and CF digestibility indicated that beyond 50% of substitution was not encouraging.

4.2 Recommendation

Since the animals were in positive weight gains, until further studies are done, the result of present study still support 50-100% replacement of PKC with CST.

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KNOWLEDGE MANAGEMENT ENVIRONMENT AS A TOOL FOR ECONOMIC DEVELOPMENT

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Abstract

Knowledge Management Environment (KME) is the term used in motivating and enabling knowledgeable individuals to use, share and create new knowledge. This study investigated how Knowledge Management Environment (KME) could serve as a tool for sustainable economic development in Ogun State. The study was carried out among some selected SMEs in the Three Senatorial Districts of Ogun State, Nigeria. In carrying out the study, two research questions were raised from where the Instrument used to gather information from the respondents was developed. A total number of one hundred (100) respondents were selected using purposive sampling technique. Also, one hundred copies of the questionnaire were produced and administered on the respondents. However, eighty two (82) copies of the questionnaire were filled and returned. The data gathered were analysed using mean method. The study concluded that the existence of Knowledge Management Environment in work environment leads to higher productivity. This in no small measure has been contributing to the economic development of Ogun State. It was recommended that experienced employees should share knowledge with the new entrants to enable them gain from their expertise so as to enhance productivity towards sustainable economic development in Ogun State.

Keywords: Knowledge Management, Knowledge Management Environment, SMEs, Economic Development, Employees' Performance

1.0 INTRODUCTION

In business environments today, activities are characterized by increasing levels of complexity, globalization and dynamism. The knowledge-base of every organisation, how new ones are created, the way the existing knowledge is implemented to compete among equals is indispensable to their performance.

Knowledge is a vital and important resource or asset, which provides organisations with a sustainable competitive advantage in any highly competitive economy (Wang and Noe, 2010). Gao, Li, and Clarke (2008) posited Knowledge as data, information, intelligence, skills, expertise, ideas, and insights. It is the integration of information into a context of experience and existing knowledge that is found in the human mind, as a result of individual’s experience and thoughts based on a set of beliefs (Pircher and Pausits, 2011).

Prusak (1996) in Squeir (2006) asserted that management must manage knowledge if they are to achieve the best value and as well ensure the best success for their organisations. Furthermore, he remarked that to manage knowledge, employees must have enough understanding about what to manage and all the relevant aspects that pertain to identifying its present state, handling any problems, envision, create knowledge-related opportunities, and making the required changes that will bring about the desired results.

Jasimuddin (2008), opined that effective management of knowledge is a critical ingredient for organisations seeking to ensure sustainable strategic competitive advantages. So, employees’ knowledge that represents one of the most complex areas facing today’s managers when it comes to managing organisational knowledge are among the most important determinants and leading factors that determine the success of organisations in a competitive environment. Besides that, if managed properly, employee commitment can lead to beneficial consequences such as increased effectiveness, performance, productivity, decreased turnover and absenteeism at both the individual and organisational levels (Fiorita, Bozeman, Young and Meurs, 2007).

Allan (2003), defined Knowledge Management (KM) as a systematic process for acquiring, organising, sustaining, applying, sharing, and renewing both tacit and explicit knowledge to enhance the
organisational performance. He stated further that Knowledge Management (KM) can lead to increase in organisational adaptability, values of existing products and services; and create new knowledge-intensive products, processes and services. It is a way of creating, executing, transforming, and storing the right knowledge that would lead to the design of better policy, modification of action, and delivery of results (Horwitch and Armacost, 2002). Therefore, knowledge management identifies knowledge needs, assets, problems and opportunities in a knowledge environment (Ponelis and Fairer-Wessels, 1998).

According to Omotayo (2015), it is pertinent to know that the selection of a suitable Knowledge Management strategy not only depends on the type of knowledge to be shared but also on the environment the organisation operates. Hence, the successful application of Knowledge Management initiatives in organisations is feasible in knowledge management environment. De Brun (2005) asserted that while implementing knowledge management tools and techniques, one should not forget the importance of creating the right kind of environment where the organisations’ workforce, processes and technology will at all times be acting as either enablers or barriers to the effective use of your knowledge management tools. So, it is necessary to identify the barriers, remove them, build on the enablers and if steps have already been taken to implement something that has not worked out as expected, this is where one needs to look. According to Garita (2015), Knowledge Management must ensure that high-quality information exists, considering that information is only useful if it is turned into one of the most valuable asset that is knowledge.

Knowledge Management Environment (KME) is about how to motivate and enable knowledgeable individuals to use, share their knowledge and create new knowledge. Also to support, provide and energize suitable knowledge environment within an organisation (Pruzinsky and Mihalcova, 2017). It is an organisational structure that facilitates synchronization between persons and information whereby a far greater environment of understanding will be created within the organisation (Almuiñas, Passailaigue and Galarza, 2015). Hence, knowledge management processes constitute contextual features of work environment that enriches job and increase job satisfaction (Morgeson and Humphrey, 2006). As a result, exercising knowledge management processes in organisations help workers in knowledge-intensive environments to establish shared understanding and derives value from knowledge (Mohrman, Finegold and Klein, 2002). However, successful companies are those that consistently create new knowledge, disseminate it widely throughout the organisation and embody it in new technologies and products.

In the Knowledge Management Environment, knowledge management processes reveal knowledge creating concerns as a continuous innovation creator; and individuals need to articulate new knowledge, combine it with existing knowledge, in order to share it with other groups or departments to create organisational knowledge. Thus, organisational knowledge is created through a continuous dialogue between the tacit and explicit knowledge of employees (Squeir 2006). Tacit Knowledge, according to De Brun (2005), is the knowledge that people carry in their heads and Explicit Knowledge is the knowledge that can be captured and written down in documents or databases. In order to enhance organisational knowledge, Knowledge Management must therefore be involved across the entire organisations’ knowledge environment. It must help knowledge development at all level, facilitate and promote its diffusion to individuals, groups, or across the entire firm, in accordance with the organisations’ requirements (Emil, 2018).

Knowledge Management importance as a critical tool in organisations cannot be overemphasized. Teng and Song (2011) opined that the importance of Knowledge Management is no longer restricted to knowledge intensive firms in the high-tech industries but to all sectors of the economy. Thus, Knowledge Management is an organisational structure that facilitates effective harmonisation between employees and information whereby a far greater environment of understanding is created within the organisation as one of the Knowledge Management essential objectives that serves as the tool for its implementation which are set by the quality of the workforce and the capacity to manage information (Almuihas et al, 2015). Therefore, Knowledge Management Environment (KME) identifies knowledge management tools and techniques, creates the right kind of environment where workers, processes and technology acts as either enablers or barriers to the effective use of knowledge management tools toward sustainable economic development in Ogun State, Nigeria.

1.2 Statement of the Problem

Today, many organisations are concerned with the usage of knowledge as an essential resource and how to devise their organisational knowledge to create and make quality products, deliver quality services to maximise the efficiency of their operations. This is based on the fact that knowledge is being seen as vital organisation’s asset which no longer lies in the ability to store and retrieve them, but in the management of its usage in a vibrant knowledge environment.
Despite the benefits derivable from Knowledge Management Environment, some organisations, most especially the Small and Medium Scale Enterprises have not been able to identify the potentials of their workers for optimal productivity. Even where workers display their skills and knowledge, enabling environment was not provided by the management. This, in one way or the other has been affecting the productivity of the organisation. This study therefore examined how Knowledge Management Environment could enhance the job performance of employees in Small and Medium Enterprises.

1.3 Objectives of the Study

The objective of this study was to investigate the effect of Knowledge Management Environment on the job performance of employees in Small and Medium Enterprises (SMEs) in Ogun State. Also, to determine the extent to which KME could enhance the productivity of the Small and Medium Enterprises for sustainable economic development in Nigeria.

1.4 Research Questions

2. How would KME influence employees’ job performance?

3. To what extent will the application of KME could enhance the productivity of SMEs towards sustainable economic development in Ogun State, Nigeria?

2.0 Methodology

The study was a survey and carried out in Ogun State. The population used for this study comprised of some selected SMEs in the three Senatorial Districts of Ogun State. A total number of one hundred (100) respondents were purposively selected for the study. Forty respondents were selected from Ogun West, Thirty from Ogun Central and Thirty from Ogun East Senatorial Districts of the State. Questionnaire was the main instrument used to gather data for the study. The instrument was validated by the Knowledge-based Experts. The instrument consists of thirteen-question item seeking information on how Knowledge Management Environment serves as a tool for employees’ performance towards organisational productivity for sustainable economy and development of the country. Respondents were asked to choose one out of the four options (Strongly Agree, Agree, Disagree and Strongly Disagree) provided for each item of the questionnaire.

For the purpose of analysis, values were assigned to the four options provided in the instrument as follows: Strongly Agree = 4 marks; Agree = 3 marks; Disagree = 2 marks and Strongly Disagree = 1 mark. One hundred (100) copies of questionnaire were administered by the researchers on the selected respondents used for the study. However, Eighty two (82) copies of the questionnaire were retrieved by the researchers. Mean method of analysis was used to analyse the data collected. A minimum of 2.5 score was set as standard for acceptability of any research question. However, the key Knowledge that enhance employees’ performance towards national development are knowledge acquisition, knowledge sharing, knowledge creation, knowledge codification and knowledge retention.

3.0 RESULT AND DISCUSSIONS

3.1 Result

<table>
<thead>
<tr>
<th>Questionnaire Items</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>Total</th>
<th>Mean</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1. Influence of KME on employees’ job performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. KME leads to employee’s innovation.</td>
<td>49</td>
<td>33</td>
<td>-</td>
<td>-</td>
<td>82</td>
<td>3.59</td>
<td>Accepted</td>
</tr>
<tr>
<td>2. It enables prompt knowledge usage.</td>
<td>43</td>
<td>39</td>
<td>-</td>
<td>-</td>
<td>82</td>
<td>3.52</td>
<td>Accepted</td>
</tr>
<tr>
<td>3. It facilitates easy knowledge sharing.</td>
<td>48</td>
<td>31</td>
<td>03</td>
<td>-</td>
<td>82</td>
<td>3.62</td>
<td>Accepted</td>
</tr>
<tr>
<td>4. It aids in creating of new knowledge.</td>
<td>42</td>
<td>32</td>
<td>08</td>
<td>-</td>
<td>82</td>
<td>3.41</td>
<td>Accepted</td>
</tr>
<tr>
<td>5. It assists in reorganising firms’ culture.</td>
<td>50</td>
<td>32</td>
<td>-</td>
<td>-</td>
<td>82</td>
<td>3.61</td>
<td>Accepted</td>
</tr>
<tr>
<td>Grand Mean =</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.55</td>
<td></td>
</tr>
</tbody>
</table>
R2. Extent to which the application of KME could enhance the productivity of SMEs.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>6. KME identifies area of weaknesses.</td>
<td>38</td>
<td>44</td>
<td>-</td>
<td>-</td>
<td>82</td>
</tr>
<tr>
<td>7. It rewrites new operational format.</td>
<td>52</td>
<td>30</td>
<td>-</td>
<td>-</td>
<td>82</td>
</tr>
<tr>
<td>8. It enforces new innovative ideas.</td>
<td>40</td>
<td>33</td>
<td>09</td>
<td>-</td>
<td>82</td>
</tr>
<tr>
<td>9. It creates continuous innovative opportunities.</td>
<td>68</td>
<td>14</td>
<td>-</td>
<td>-</td>
<td>82</td>
</tr>
<tr>
<td>10. It improves organisations’ knowledge strengths.</td>
<td>42</td>
<td>40</td>
<td>-</td>
<td>-</td>
<td>82</td>
</tr>
<tr>
<td>11. It strengthens the identified weaknesses.</td>
<td>23</td>
<td>39</td>
<td>07</td>
<td>03</td>
<td>82</td>
</tr>
<tr>
<td>12. It prevents threat to knowledge storage.</td>
<td>35</td>
<td>45</td>
<td>02</td>
<td>-</td>
<td>82</td>
</tr>
<tr>
<td>13. It aids in knowledge applications.</td>
<td>50</td>
<td>32</td>
<td>-</td>
<td>-</td>
<td>82</td>
</tr>
</tbody>
</table>

Grand Mean = 3.46

Field Survey, 2019

3.2 Discussion

Questions One to Five were used to gather data on the research question one. The results were 3.59, 3.52, 3.62, 3.41 and 3.61, respectively which revealed that the research question was accepted. Based on the results gathered from the study, the Grand Mean of 3.55 was generated which reflects that the respondents were of the opinion that KME influences employees’ job performance. The result of this study collaborates with Morgeson and Humphrey (2006) views that knowledge management processes which come up in knowledge management environment constitute contextual features of work environment that enriches job and increase employees’ job satisfaction.

Also, it is in consonance with Fiorita, Bozeman, Yung and Meurs (2007) that employees are among the most important determinants and leading factors that determine the success of an organisation in a competitive environment. Besides that, if managed properly employee commitment can lead to beneficial consequences such as increased effectiveness, performance, productivity, decreased turnover and absenteeism at both the individual and organisational levels. So, Knowledge Management Environment is an organisational structure that facilitates synchronization between person and information, whereby a far greater environment of understanding will be created within the organisation. It is one of the essential objectives of Knowledge Management, and so the necessary conditions for carrying it out are conditioned by the quality of the human factor and the capacity to manage information (Almuiñas et al., 2015).

Questions Six to Thirteen were used to gather data on research question two. The results were shown as 3.46, 3.63, 3.38, 3.83, 3.53, 2.76, 3.40 and 3.72 respectively, while the Grand Mean is 3.46 as an indication that the research question was accepted. This is in consonance with Pruzinsky et al (2017) belief that Knowledge Management Environment supports, creates, provides and energizes suitable knowledge environment within an organisation. They remarked further that Knowledge Management motivates and enable knowledgeable individuals to use and share their knowledge and create new knowledge to enhance productivity (Pruzinsky et al., 2017).

The result of this study was in line with Gharakhani et al (2012) and Obeidat et al (2016) views that the importance of Knowledge Management for organisations which creates new capabilities for organisations, enables superior performance, encourages innovation, and enhances customer value. Also, it was in agreement with Chen (2011) that managing knowledge well assists organisations in becoming flexible, responding quickly to changing conditions, becoming innovative, and improving decision making capacity and productivity.
4.0 CONCLUSION AND RECOMMENDATION

4.1 Conclusion

Knowledge Management Environment creates enabling atmosphere for knowledge management activities to thrive. It is where the Knowledge Management x-rayed its components and getting them prepared for implementation. In essence, Knowledge Management Environment creates the right kind of environment where Knowledge Management tools and techniques are used as enablers to the improvement of organisational decision making for the effective utilisation of Knowledge Management activities for sustainable economic development. In other words, it identifies the barriers to productivity, remove them and as well build on the enablers of knowledge management processes towards sustainable economic development of a nation.

It can be concluded in this study that Knowledge Management Environment stimulates enabling environment to manage the knowledge of organisations to create new innovative opportunities for organisations’ workforce to performance. Also, the study concluded that creating enabling Knowledge Management Environment in organisations do enhance their productivity. However, this assertion corroborates Pruzinsky and Micălová (2017) position that the existence of knowledge management processes in one’s working environment is significantly linked with high job satisfaction and that the practical implementation of knowledge management has strong impact on employees’ satisfaction. So, in a knowledge-based economy, Knowledge Management is increasingly viewed as critical to organisational effectiveness and performance (Bosua and Venkitachalam, 2013). Therefore, the existence of Knowledge Management Environment in organisations serves as a tool for the sustainable economic development of a nation and thereby enhances employees’ performance towards national development.

4.2 Recommendations

For Knowledge Management Environment to serve as a tool for sustainable economic development of a nation, the following recommendations were made that:

- Management should ensure that effective knowledge management environment exists in organisations from time to time for workers to be innovative.
- Management should train and retrain their employees for effective job performance.
- Management should encourage Knowledge Management Environment to aid knowledge usage and sharing.
- Management should create Knowledge Management Environment for easy identification of organisations’ weaknesses and threats to knowledge storage.
- Management should provide enabling environment in their organisations for the improvement of their organisational knowledge strengths and its applications.
- Management should implement knowledge management policies in their organisations, not only for the sake of improving workers’ performance but also for improving their wellbeing at work.
- Employees should be ready to utilize the acquired knowledge for the betterment of their organisations.
- Experienced employees should share knowledge with the new entrants to enable them gain from their expertise so as to enhance productivity towards sustainable economic development.

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FNWC_Paper_034

ROLES OF INFORMATION COMMUNICATION TECHNOLOGY (ICT) ON ECONOMIC DEVELOPMENT OF WOMEN IN OGUN STATE

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ABSTRACT

This study spotlights the roles of Information Communication Technology (I.C.T.) on economic development of women in Ogun State using the women in Ilaro; Yewa South Local Government as a study. This study is premised on the framework of two theories: The Uses and Gratification Theory and Media Dependency Theory. Some of the objectives of the study is: To examine the rate at which illiteracy level determines the use of ICT applications such as social media; to examine if the use of social media by women is advantageous to their economic development. The descriptive research design was adopted for the study; the population comprised of women in Yewa South Local Government from where a sample size of one hundred (100) respondents was picked using simple random technique. From the findings (based on some of ICT applications used by women such as Facebook, WhatsApp, Instagram, etc), It was discovered that social media helps to create awareness for goods and services, and its use also leads to economic development of women; Facebook is the most popular ICT applications used by respondent. Finally, it is concluded that Women’s engagement in ICT applications such as social media is active and in-depth in terms of learning and education. It is therefore recommended that women need to be educated more on the use of ICT applications in order to ensure proper use of its tools so as to bring about desired results.

Keywords: Information Communication Technology (ICT), Social Media, Economic Development, Women, Facebook

1. INTRODUCTION

Culturally, especially in the western part of Nigeria, women’s place is basically at home and kitchen and this had resulted in women’s voices being muted and in most cases their opinions are not sought on important issues even those that concern them. It is their male counterparts that are considered more intelligent and being called upon to proffer solutions to challenges faced by women and which in most cases are wrong approaches and inappropriate. Charmes & Wieringa 2003).

In many parts of the world women are the home makers, they are the coordinators of both their children and husbands mostly found to be fully involved in running homes rather than working. But in the 21st century the definition of woman and womanhood is fast changing, this is because women are now found to be captains of industries and Chief Executive Officers of companies and industries. Notwithstanding that today’s women are working and effectively involved in policy making of their communities, states and nations, they combine their duties with home building and children rearing though a little percent of them now cling to career rather than being home makers and children rearers.

It has been noted however that women are better managers of both human and natural resources and this had been shown to be true in many cases which had afforded women the opportunity of venturing out to be relevance in other fields and capacities other than at home and kitchen. And this had led to women being engaged in various activities that can improve their economic abilities and development.
In this period of rapid technological developments and an ongoing information revolution, one of the key by-products is incessant change. Two of the main characteristics defining this historical period are the twin concepts of globalization and the information economy. This transformation which embodies social, economic, political, technical and cultural processes is affecting nearly all economies and creating tremendous challenges and opportunities in its wake. (Charmes & Wieringa 2003).

African countries will not be (and have not been) spared, although there is still concern that the gap from the rest of the world is widening. Within this context, many studies and initiatives are concerned with ensuring that African countries are prepared to meet the challenges of the information age, and their main thrust seems to revolve around access to information and communication technologies (ICTs) and ICT policy development in general. (Ahmed et al, 2008)

By definition, ICTs include electronic networks embodying complex hardware and software - linked by a vast array of technical protocols. ICTs are embedded in networks and services that affect the local and global accumulation and flows of public and private knowledge. According to the United Nations Economic Commission for Africa, ICTs cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, and other related information and communication activities; quite an expansive definition. It is not uncommon to find definitions of ICTs that are synonymous with those of information technology (IT). For example, Foster defines IT as 'the group of technologies that is revolutionizing the handling of information' and personifies a convergence of interest between electronics, computing and communication. (Ahmed et al, 2008)

The terms designate the information processing interaction between providers and users of information and also the development and application of information-processing systems that may not be regarded as part of the development of telecommunications. It is important to emphasize that these technologies only provide new mechanisms for handling an already existing resource: information. Therefore, to understand ICTs, one must first understand information practices and needs.

Nevertheless, in African countries, there is considerable interest in exploiting ICTs in all sectors. In the economic sphere, interest in ICTs is partly inspired by a belief that they are increasingly essential for the efficient use of resources in general. For example, in the short term, low-wage countries may be able to compete in international markets without having to make much use of the newer technologies, but, in the longer term, income growth is likely to be constrained along the path of low productivity growth. Also, since the new technologies are often concerned with quite new areas of activity - software production or data-entry services, for example - a failure to develop the capability to make use of them could preclude other important opportunities.

In Nigeria, ICT opened access to education and knowledge. A big breakthrough in ICT technologies occurred in the 1960s. Computers, Internet, and Web changed the lives of Nigerians. Nigeria is the most populous country in Africa. The country has huge urban growth rate at present time. This is a good condition for the upsurge of Internet usage, and the usage of ICT technology in such areas as education, health, agriculture, business, government, and transportation. Such development has been observed since the last 15 years. Internet usage level in Nigeria in 2012 was less than 16% and this is a very low rate. In 2013 Nigeria had 1.38 Mbps of average download speed. The rate is extremely low in comparison with 10.1 Mbps - the download speed of USA. In 2012 28.4% of the population were Internet users. In 2013 the download speed increased to 5.22 Mbps. (Legit, 2013)

Nigerian ICT development is under the rapid transformations especially in the field of mobile communication. In 2013 about 83% of the population (166.6 million people) were active subscribers of mobile phones. ICT has huge potential to transform a society. ICT can reduce the rate of poverty and improve the economic and social status of people. A major function of ICT is being a tool that helps organizations, businesses, and individuals to use information in the most accessible and convenient way. ICT covers all the products or devices that can transmit or receive, manipulate or retrieve information in digital form. ICT involves not only the technology but also the processes of retrieving, storing or transmitting digital data. ICT includes any computing hardware and the hard and software for operating the networks for transmission of information.

The application of ICT is very crucial especially in renewable energy, agriculture, environmental conservation, and water. The population is rapidly growing but the resources are depleting so, we need to evolve the judicious
utilization of resources. Of course, information cannot be the only panacea to poverty, hunger, diseases or illiteracy. But the information, if used the right way and in the right time can help bring solutions. (Legit, 2013)

Empowerment on the other hand, refers to the ability of people to control their own destinies in relation to other people in society (Mason, 2005). There is no universal definition of women’s empowerment as factors such as socio-cultural, geographical, environmental, political and economic, as well as many other aspects of countries and regions influence it. Kabeer (1994) offers a definition of empowerment as ‘the expansion in people’s ability to make strategic life choices in a context where this ability was previously denied to them’.

According to The World Bank (2008): empowerment is the process of increasing the capacity of individuals or groups to make choices and to transform those choices into desired actions and outcomes. So, one definition of women’s empowerment could be a process that gives them control of power and resources, and changes women’s lives over time through their active participation in that process.

The domestic or household level is the central point of gender-based discrimination and the goal of empowerment. (Narayan-Parker, 2005) because of the power relation in the family hierarchy. Domestic power dynamics can be analysed by an individual’s access to and control of different ‘spaces’ such as physical, economic, socio-cultural and political, and non-physical within the domestic level.

The mental space of women remains the most critical issue since it has a complex relationship with other non-mental spaces. Mental or psychological space consists of the feeling of freedom that allows a person to think and act. For example, it often happens that interventions that expand a woman’s economic space with increased income do not empower her if she has no control over the income. Therefore, expansion in economic space alone will not bring about empowerment. If the interventions increase a edit level of confidence and self esteem, then a process of empowerment has began. An expansion of this space implies a change in perception and leads to a feeling of strength. Hence, understanding the link with other spaces will help policy makers to understand why some interventions fail in spite of an increase in physical, economic and political spaces (Ranadive, 2005). Though some ICT interventions in Nigeria are not benefiting rural women economically (Alam, 2006; D.Net, 2007), they are helping to provide required information to rural women, which eventually changes their perceptions and expands their self-esteem as human beings. This issue needs to be investigated; that is, whether ICT can empower rural women with or without economic benefit.

The Need for Women’s Empowerment: The World Bank (2001) developed a two-pronged strategy to eradicate poverty: large scale investment in developing countries; and empowerment of underprivileged people. Therefore, disadvantaged people have the potential to develop their lives and eradicate their poverty if they are empowered. Women are half of the total population in the world yet 70% of the world’s disadvantaged are women (Actionaid, 2006). Many women are the poorest of the poor because of the extreme forms of discrimination that persist in many parts of today’s world (Obayelu & Ogunlade, 2006). Women are, therefore, not only the representatives of impoverished people in the world but they are also the most deprived and the cross-cut category of individuals that overlaps with all other disadvantaged groups (the poor, ethnic minorities, etc.). Although actively participating in taking care of children, family members, livestock and agricultural work (food production, preservation and processing), household work, health care and so forth, women have limited access to resources and economy. The World Bank (2008) has identified empowerment as one of the key constituent elements of poverty reduction and sustainable development. So, it is important to empower women to change their lives through eradicating poverty and enabling their contribution to society.

How Ict Can Aid Women’s Empowerment Information is noted as a prerequisite for empowerment, while participation drives empowerment by encouraging people to be actively involved in the development process, contribute ideas, take the initiative to articulate needs and problems and assert their autonomy (Obayelu & Ogunlade, 2006). The UN millennium development project (United-Nations, 2005) focused on globalisation as well as gender equality and empowerment of women as effective ways to combat poverty in a sustainable way. Women’s full and equal access to ICT-based economic and educational activities support women’s contribution in business and home-based activities and help women to become more empowered. By accessing information, women can enrich and enhance their quality of life. Successful case studies from many countries described the use of ICT as a tool for the economic empowerment of women (Prasad & Sreedevi, 2007), participation in public life (Lennie, 2002), and (Mitchell & Gillis, 2007). When used effectively, ICT can create better opportunities for women to exchange information, gain access to on-line education and to engage in e-commerce activities (Marcelle, 2002).
1. Alternatively, the consolidated framework developed by Chen (1997) details four broad pathways through which individuals’ experiences change:

2. Material pathway, through which changes in access to or control over material resources, such as in the level of income, in the satisfaction of basic needs or in earning capacity, are experienced.

3. Cognitive pathway, through which changes in level of knowledge, skills or awareness of wider environment are experienced.

4. Perceptual pathway, through which changes in individual confidence level and self-esteem and vision of the future as well as changes in recognition and respect by others are experienced.

Relational pathways, through which changes in decision-making roles, bargaining power, participation in non-family groups, dependence on others and mobility are experienced.

To fully understand the process of change, Chen (1997) details two types of variables: the key participation variables (i.e. demographic profile of the client, household dependency ratio and the economic portfolio mix of the household) which are designed to measure the different levels of contact that a woman might have with various services offered by micro enterprises; and the mediating variables (i.e. social norms such as gender division of labour, gender norms of behaviour and gender allocation of resources), which are thought to affect the direction and strength of the relationship between participation in micro-enterprise services and impacts on individual level.

Ilaro is situated in the centre of Egbado land midway between the land area comprising Egbado North and South. This central position resulted in its being traditionally designated the administrative headquarters of the entire Egbado land from 1914 to 1976, when the new Local Government set up was established. It is today the Headquarters of Egbado South Local government.

Ilaro occupies an area of some 9.5 square kilometres of land and is situated on the rich cocoa belt of South Western Region of Nigeria with an above average rainfall.

Occupation and religion of the people of Ilaro

Ilaro people are predominantly farmers while others, especially women are traders. A very small percentage of the people are artisans.

Some ICT applications used by women for economical developments are:

What is regarded today as social media includes amongst others the following:

**Social Networking Sites:** This type of social media allows users to connect by creating personal web pages and then connect with friends to share contents and communication. The very common and most popular social network includes: Facebook, Snap chat, Instagram, and twitter, linkeln, MySpace. It is used to connect people globally and it mostly includes personal profile, finding friends, and communities. They are also the common phrase that are used an umbrella term for all social media and computer mediated communication. It is also used to describe community base website, online discussion forum, chat rooms and other social web space online. Ellison and Boyo (2007), cited in Osharive; 2015, defined social networking sited as web-based services that allow individuals to construct profiles, display user connections, and search and transverse within that list of connections. It can also be described as a website that allows users to share information within a selected group. It is also said to be a great way to stay connected and; a convenient way to share photos from trips. Awake; 2012 cited in Oshareva (2015).

**Podcasts:** These are multimedia contents (audio and video) syndicated over the internet via a web feed. They deal with audio and video files that are available online and people can have access to by subscribing through services like apple iTunes. It is a combination of broadcasting and iPod. It enables users to download audio files that can be played on computers and portable devices. (For use on portable media players like: iPod, mp3player; personal computers.

**YouTube:** This provides a home for PSAs and educational videos; it was founded in February 2005; it has large accessibility and good resource for schools and organizations. It is easy and convenient to use. And it can as well be linked or embedded across the internet. It is the world’s most popular online video community, people watch and share originally – created videos. It is also the second search engine in the world.
Facebook: Started in 2013 by Harvard students, it is a platform to share announcements, requests for feedbacks, questions, and links with an interested community that also gives people place to share information with each other. It is person to person, groups, or page based accounts. This enables users to create a central page, check post, browse sites with its simple layout and it also provides space for basic information and variety of posts types with its potential audience. An average user spends almost 1 hour per day on Facebook.

Twitter: This is used mostly for short facts or reminders. It (#) hash tags group together similarly themed tweets. It can as well be linked to Facebook, it provides an On-The-Go updates for reminders. Integrated with cell phones and texting. It is short text updates, about 140 characters.

Instagram: This is a social networking application that is made for sharing videos and photos. It is very similar to twitter and Facebook: everyone who create an account will have a profile and news feed whenever they post videos or photos on it. It will be displayed on their profile and other users who follow the will be able to see their post in their feed and you will also see posts from other users that you follow.

Whatsapp Messenger: This is a free download messenger application; it uses the internet to send messages, images, audio etc. It has similar service like text message service but it rather uses internet to send messages. It was founded in 2009 by an ex yahoo employees. It enables users to share their location in real time messages etc.

LinkedIn: This is a social media networking site that is designed specifically for the business community. The goal of this type of social media is to allow registered members to establish and document networks of people they know and trust professionally. It was launched in May 2003.

Objectives of the study
- To examine the rate at which illiteracy level determines the use of ICT or social media
- To examine if the use of social media by women is advantageous to their economic development.
- To study the social media application(s) mostly by women in Ilaro.

Theoretical framework
This study is premised on a frame work of the following theories:
Uses and Gratification Theory
The uses and gratification theory developed by Katz, Blumler, and Gurevitch (1974). This theory suggests that audience are responsible for selecting the media that would best serve their need. The uses and gratification theory, is an influential tradition in media research. The original conception of the approach was based on the research for explaining the great appeal of certain media contents. The core question of such research is: why do people use media and what do they use them for? (McQuail, 1983)

In mass communication process, uses and gratification approach puts the function of linking need gratification and media choice clearly on the side of audience members. It is suggested that people needed influence what media they would choose, how they use certain media and what gratifications the media give them. This approach differs from other theoretical perspectives in that it regards audience as active media users as opposed to passive receiver of information in contrast to traditional media effects theories which focus on “what media do to people” and assume audience are homogeneous, uses and gratification approach is more concerned with “What people do with media” (Katz, 1959) cited in communication theory, wikibook.org (2013).

Needs and Gratification
The uses and gratification approach is known to emphasizes motive & the self-perceived needs of audience members. Blumler & Katz (1974) concluded that different people can use the same communication message for very different purposes. The same media content may gratify different needs for different individuals. Basic needs, social situations, and the individual’s background such as experiences, interest, and education, affect people’s idea about what they want from media and which media best meet their needs. That is audience members are aware of, and can state their own motive and gratifications for using different media. Katz, Gurevitch & Haas (1973), also developed 35 needs which is taken from the social and psychological functions of the mass media and put them into five categories:
1. **Cognitive need**: including acquiring information, knowledge and understanding;
2. **Affective needs**: including emotion, pleasure, feelings;
3. **Personal integrative needs**: including credibility, stability, status;
4. **Social integrative needs**: including interacting with family and friend; and
5. **Tension release needs**: including escape and diversion.


In line with the words of Katz et al (1973), McQuail’s (1983) classification of the following reasons for the use of the media:

**Information**

1. Finding out about relevant events and conditions in immediate surroundings, society and the world
2. Seeking advice in practical matters or opinion and decision choices
3. Satisfying curiosity and general interest.
   - Learning self-education
4. Gaining a sense of security through values

**Personal Identity**

3.0 Finding reinforcement for personal values
4.0 Finding models for behavior
5.0 Identifying with valued others (in the media)
6.0 Gaining insight into oneself

**Integration and social interaction**

- Gaining insight into the circumstance of others; social empathy
- Identifying with others and gaining a sense of belonging
- Finding a basis for conversation and social interaction
- Having a substitute for real life companionship
- Helping to carry out social roles ‘Enabling one to connect with family, friends and society

**Entertainment**

- Escaping or being diverted, from problems
- Relaxing
- Getting intrinsic cultural or aesthetic enjoyment
- Filling time
- Emotional release
- Sexual arousal


2. **Media Dependency Theory**

The media dependency theory was introduced in outline by two America communication researchers; Sandra Ball-Rokeach and Melvin DeFleur in (1976). This theory is said to be a systematic approach to the study of the effects of mass media on audience and of the interactions between media, audience, and social system. (Ball-Rokeach & De-Fleur; 1976) The media dependency theory is also known as media system dependency theory and it is said to have been explored as an extension of or an addition to the uses and gratification approach. Thought, there is said to be a very subtle differences between the media dependency theory and uses and gratification theory, the media dependency theory can looks at audience goals as the origin of the dependency while on the other hand, the uses and gratification approach emphasizes audience needs (Grant et al. 1998). These two theories can however be said to be in agreement that media use can lead to media dependency. However, Palmgreen, Wimmer & sengren, (1985); Rubin (1993); Parker Plank, (2000), cited in (communication theory; 2013), in their various studies averred that uses and gratification studies discussed media use as being gratification directed. The media dependency theory also states that more dependent an individual is on the media for having his or her needs fulfilled, the more important the media will be to that person. Dependency
theory according to Ball-Rokeach&DeFleur (1976) also conceives of dependency as a relationship in which the fulfilment of one party’s need and goals is relevant on the resources of another party of the theory is the relationship between media and audiences. Ball-Rokeach and DeFleur averred that in industrial and information based society, individuals tend to develop a dependency on the media to satisfy a variety of their needs, which can range from a need for information; to a need for relaxation and entertainment. DeFleur & Ball-Rokeach (1976) also described dependency as the correlating relationship between media content, the nature, and society, and the behaviour of audience.

As DeFleur and Rokeach (1989) suggested, active selector’s use of the media to achieve their goal will result in being dependent on the media. People will become more dependent on media that meet a number of their needs than on media that provides only a few ones. Littlejohn, (2002) while Rose (2002) stated that “if a person finds a medium that provides them with several functions that are central to their desire, they will be more inclined to continue to use that particular medium in the future” In general, the extent of the media’s influence is said to be related to the degree of dependence of individuals and social systems on the media. Ball-Rokeach &DeFleur, therefore put forward two basic propositions and these are: The greater the number of social functions performed for an audience by a medium (e.g. providing entertainment and information, the greater the audience’s dependency on that medium. The greater the instability of the society (e.g.; in situation of social change and conflict), the greater the audience’s dependency on that media. Therefore, the greater the potential effect of the media on the audience. According to Ball-Rokeach & DeFleur, there are three major potential types of effects that result from an audience’s dependency on the media:

**Cognitive effects:** These are changes in an audience’s attitudes, believe, and values including changes brought about by the media in its role in political agenda setting.

**Affective effects:** This includes the development of feelings or fear and anxiety about living in certain neighbour hoods as a result of overexposure to news reports about violent events in such areas.

**Behavioural effect:** A good example of this is “deactivation” and this occurs when an individual member of an audience refrains from taking certain action that they would have taken; had they not been exposed to certain messages from the media. Finally, since its inception, the media dependency theory has generated many cross-disciplinary studies. It has also served well as a theoretical basis for research in the domain of communication. (Yang Lin; 2018)

2. **METHODOLOGY**

The Research Design adopted for this study is the descriptive research design which afforded the researchers the opportunity to collect data without manipulating any of the variables of interest in the study. The statistical tool used in the study in the simple use of percentage

Research Population: the population for this study comprised of women living and conducting business in Yewa South Local Government area of Ogun State.

Sample and Sampling Techniques: the sample for this study comprised of one hundred respondents that was randomly selected for this study. The women used for sample of this study were drawn from the Federal Polytechnic community and generally from the town.

A self-designed questionnaire was used for gathering the data needed. The questionnaire was divided into two sections (sections A & B). Section A requested for the personal information of the respondents while section B consisted of questions relating to the variables under investigation. The questions were structured in a way to elicit required information on the phenomenon under study.

**Results**

**Table 1: Do you agree that social media can be used to improve economical status?**

<table>
<thead>
<tr>
<th>Responses</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Agree</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Uncertain</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Field survey, 2019
From Table 1 above, (55%) of the respondents strongly agree that social media can be used to improve economic status while (35%) also agreed, only (6%) were uncertain about this opinion. Meanwhile, (2%) of the respondents disagree and strongly disagree to this. This table indicates that social media can be used to improve economic status of women.

Table 2: Do you agree that the use of social media depends on one’s educational level?

<table>
<thead>
<tr>
<th>Responses</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Agree</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Uncertain</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Disagree</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field survey, 2019

The table above indicates that majority of the respondents were of the opinion that the use of social media depends on one’s educational level with (40%) and (30%) of the respondents that strongly agree and also agree to this while (15%) were uncertain; only (10%) disagree to this and (5%) strongly disagree as well. This goes a long way to show that the use of the social media does not depend on one’s educational level.

Table 3: Is social media helpful in creating awareness for your goods and services?

<table>
<thead>
<tr>
<th>Responses</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>72</td>
<td>72</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field survey, 2019

The above table indicates that (72%) of respondents agree that social media helps to create awareness for goods and services while (28%) of the respondents disagree with this. This is an indication that social media can be used to create awareness of goods and services provided by women which can increase their economical development.

Table 4: what are the social media applications you use to promote your goods and services?

<table>
<thead>
<tr>
<th>Responses</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>WhatsApp</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Instagram</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Linkedin</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>You tube</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field survey, 2019

Table 4 showed that (41%) of the respondents used Facebook while (27%) used WhatsApp, while (12%) used Instagram, (13%) used YouTube and only 7% makes use of LinkedIn. This tables shows that Facebook was the most popular of the applications used by respondents to create awareness about goods and services.

Table 5: Do you agree that social media enhances economic development of women?

<table>
<thead>
<tr>
<th>Responses</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td>Agree</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Uncertain</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Disagree</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field survey, 2019
From the above table, (62%) of respondents agreed that social media enhances economic development of women; (23%) also strongly agree to this while (10%) were uncertain and only (5%) disagreed.

3. DISCUSSION OF FINDINGS

It was discovered that most women who are ICT literate and users are educated with minimum education level from secondary school leaving certificate to Masters and beyond. Though there were a very small percentage of ICT users that were not educated beyond primary school. And these set of ICT users employed many social media applications to promote their businesses, trades and crafts and the use attracted many followers and audiences’ part of who patronises them.

With the use of ICT and social media to promote trades, businesses and crafts, women now have bigger exposure for their entrepreneurial activities and it had afforded some of them to do on-line businesses as well.

It was also revealed that most women who are using ICT and had upgraded economically due to its use mostly make use of WhatsApp and Facebook.

Women who are not using ICT and social media to promote their businesses and trades were found to be operating on a smaller scale and mostly are not educated beyond primary school certificate.

Part of the findings was that all the women who are not using ICT or who do not know how to use ICT did not know that their mobile phones have more uses other than to take and make calls.

The Internet, the wireless telephone and other information and communication technology enable women to communicate and obtain information in ways never before possible. It has also increased participation in decisions that affect women’s lives.

4. CONCLUSION & RECOMMENDATION

Conclusion
This paper discussed the issue of women empowerment using ICT tools/social media applications, and its results in the economic development of women. It can be concluded that if women’s engagement in ICT is active and in-depth in terms of learning and education, then women could become more empowered.

Recommendation
Poverty could be alleviated in rural populations through women acquiring knowledge and education. It is recommended that special schools be established for women irrespective of age for those who are willing to be educated. It is also important that women are enlightened about usefulness of ICT to their economic development. Generally, there is the need to educate women in the use of ICT and ensure proper use of the tools so as to bring about desired results.

REFERENCES


Abstract

Achieving a considerable level of operational effectiveness of female workers in the employment of technical and vocational education is essential to the management of institutions. This study, therefore, considered combating sexual harassment for the operational effectiveness of women in the employment of technical and vocational education in Ogun State, Nigeria. Three hypotheses were formulated; the population of the study consists of female employees in Technical Vocational Institutions in Ogun State, Nigeria. Sample of one hundred twenty (120) female staff was randomly selected from three technical vocational educations in Ogun State (Federal University of Agriculture, Abeokuta, The Federal Polytechnic, Ilaro and College of Education Osiele, Abeokuta) currently in service of the institutions. Two-structured questionnaires tagged Situation-Specific Assessment of Sexual Harassment (SSASH) Suzanne (2001), and Questions for Operational Effectiveness (QOE) Connie (2013) was adapted. Z-test at 5% level of significance was employed to test hypotheses for validating sexual harassment and the effectiveness of workers. The result shows that sexual hostility and unwanted sexual attention harms employees' efficiency on the job. Sexual coercion was found to be statistically insignificant, which induce that sexual coercion does not have any effect on the operational effectiveness of women in technical education. It was concluded, that combating sexual harassment for effective job performance of female employees in specialized training needed to be geared towards other directions rather than rape and coercion. It was therefore recommended that employers should provide education and information about harassment to all staff. The study also sensitized females on types of sexual harassment that goes on in the workplace and how to prevent it from happening.

Keywords: Combating, Sexual Harassment, Operational Effectiveness, Technical and Vocational Education

1.0 INTRODUCTION

Understanding gender differences are a product of the conversion of inputs into outputs in the form of products and services for organisational success, which is known as operational efficiency and job satisfaction. Studies have shown that the wave of public accusations of sexual harassment and assault has rolled across workplaces in Nigeria, the prevailing silence on sex-based harassment in the workplace has continued to affect workers, particularly women negatively, personally and professionally (Rizzo, Theodore, Stevanovic-Fenn, Smith, Glinski, O’Brien-Milne, and Sarah, 2018). Sexual harassment issue has become more prominent in the last ten years. As the increasing number of cases reported, several countries have taken legal action to recognize it as misconduct and at the same time to punish and prevent it. Sexual harassment has frequently been reported as a critical problem, particularly in educational institutions (Siti, Zainuddin, Ahmad, Nur & Suzila, 2015).

Sexual harassment is an unwelcome behaviour, sexual nature, which is offensive, embarrassing, intimidating or humiliating and may affect an employees’ work performance, health, career or livelihood (Sabitha, 2008). The definition applied to both gender and addressed the effects of sexual harassment on the victims. Siti et al. (2015) point out that an individual has different perceptions of what constitutes sexual harassment, and a definition is almost impossible to construct.

Sexual harassment includes a wide range of behaviours, from glances and rude jokes to demeaning comments based on gender stereotypes to sexual assault and other acts of physical violence (Iro-Idoro, 2018). Although the legal definition varies by country, it is understood to refer to unwelcome and unreasonable sex-related conduct.
Sexual harassment is considered as “any unwelcome sexual advance, request for sexual favour, verbal or physical conduct or gesture of a sexual nature, or any other behaviour of a sexual nature that might reasonably be expected or be perceived to cause offence or humiliation to another. Such harassment may be but is not necessarily, of a form that interferes with work, is made a condition of employment, or creates an intimidating, hostile, or offensive work environment” (World Bank. Women, Business and the Law, 2014).

Sexual harassment is a form of sex discrimination that applies to harassment by a person against another person of the opposite sex as well as harassment by a person against another person of the same sex. It also occurs when an employee is subjected to unwelcome or unwanted sexual conduct that is sufficiently pervasive or severe to alter the terms or conditions of the employees’ employment, such manner unreasonably interferes with an employee’s work performance or creates an abusive, intimidating, offensive or hostile work environment. A manager, supervisor, co-worker, or even a non-employee such as a vendor, customer or third party can create a hostile environment (Jimoh, Jolaade, Durowaiye, Iro-Idoro, 2015).

Sexual harassment is defined by law and includes requests for sexual favours, sexual advances or other sexual conduct when submission is either explicitly or implicitly a condition affecting academic or employment decisions. The behaviour is sufficiently severe or pervasive as to create an intimidating, hostile or unfriendly environment and when the practice persists despite objection by the person to whom the conduct is directed. The University considers such behaviour, whether physical or verbal, to be a breach of its standards of conduct and will seek to prevent such incidents and take corrective measures when sexual harassment occurs (Office of Institutional Equity, University of Michigan, 2019).

Sexual harassment is divided into two major types, namely Quid pro quo and hostile work environment. Quid pro quo (this for that) harassment occurs when an employee is offered some job benefit such as promotion, pay raise, etc., in return for sexual favours or is subjected to some adverse action because of a refusal to submit to a request for sexual favours (Jimoh et al., 2015 and Iro-Idoro, 2018) . Quid pro quo sexual harassment also occurs when it is stated or implied that an individual must submit to conduct of a sexual nature to participate in a University program or activity. So, for example, if an employee is made to believe that a promotion is likely if the employee goes on a date with the supervisor, the employee is possibly being subjected to "quid pro quo” sexual harassment (Jimoh et al., 2105 and Iro-Idoro, 2018).

Hostile environment sexual harassment occurs when unwelcome conduct of a sexual nature creates an intimidating, threatening or abusive working or learning environment or is so severe, persistent or pervasive that it affects a person's ability to participate in or benefit from a University programme or activity. The harasser can be a peer of the person being harassed. Sometimes the harasser is harassing a person who has power over them. For example, a supervisee can sexually harass a supervisor, or a student can sexually harass a faculty member (Office of Institutional Equity, University of Michigan, 2019).

Effectiveness is doing the right thing or occupying oneself with the right thing. The concept of effectiveness is linked to the assumption that organisations are goal-oriented. The focus is on the actual attainment of organisational goals and not so much on the means necessary to reach them or the speed at which they are achieved. For this reason, not everything useful has to be efficient; but everything dynamic has to be effective (Lodewijk, 2016). Measuring your employees' effectiveness is an essential part of managing a team, and ensures your organisation is running at its most productive. Employee effectiveness must be maintained and measured to ensure that not only are employees effective in their roles and in meeting the objectives of the organisation but also that they are engaged and challenged (Gina, 2016).

Effectiveness is conceptualized in four approaches, and these are the Goal Achievement Approach, which is the fulfilment level of organisational objectives and the final achievements of the organisation. Systematic Approach is the ability in using and processing data to achieve and maintain stability within the organisation. Strategic Factors Approach is the ability to fulfil the expectations of external factors on which organisation stability depends. Competitive Values Approach is identifying all fundamental variables which influence the performance of the organisation and the connection of these variables (Tahereh, Khalil, & Zahra, 2012).

Organisations have also come to realize that to be relevant in the current competitive and globalized business environment; there is a need to reassess their competing imperatives to remain viable and competitive continually. Management is fully aware that enhancing its employees' effectiveness through a performance management system and policy implementation can facilitate its efforts to sustain and improve organisational
efficiency. Compton (2005) opined that there is ample evidence to suggest that companies which utilize performance management systems and policy implementations can strategically perform more effectively (Teo & Low, 2016).

The organisational performance involves the recurring activities to establish corporate goals, monitor progress toward the goals, and make adjustments to achieve those goals more effectively and efficiently. While examining the relationship between quality principles and practices and performance, scholars have used different performance types such as financial, innovative, operational and quality performance (Rula, 2017). Employee effectiveness can be assumed as an enhanced level of employee performance that would lead to higher productivity. Employees’ effectiveness will survive and flourish if each organisation gains meaning from the employees. Thus, the closer the objectives of employees and those of manager and organisation to each other, the easier it would be to achieve those objectives; therefore, the goals of managers and employees would be realized.

The incidents of sexual harassment have also been related to withdrawal from the organisation (Gruber, 2003). Two different constructs usually measure removal, firstly, work withdrawal which is being late, neglectful, avoiding work tasks while the second construct is job withdrawal that is turnover or intention to leave the organisation (Hanisch & Hulin, 1990). Workers’ productivity will reduce the quantity and quality of work, lessen the willingness to cooperate and work with others as well as low level of productivity is another cost of sexual harassment (Lengnick, 1995). Studies have shown that some of the victims are aggressive and reactive, as well as task avoidance (Siti, 2015). Suzanne, Mindy, Nicole, Fritz, & Louise, (2001) identifies four tools for measuring sexual harassment as Sexist Hostility, Sexual Hostility, Unwanted Sexual Attention and Sexual Coercion but for this study, the last three will be considered while the first one will be dropped for further research.

**Sexual Hostility** occurs when unwelcome comments or conduct based on sex, race or other legally protected characteristics unreasonably interferes with an employee’s work performance or creates an intimidating, hostile or offensive work environment. It is a work environment created by unwelcome sexual behaviour or behaviour directed at an employee because of that employee's sex that is offensive, hostile and intimidating and that adversely affects that employee's ability to do his or her job (Jimoh et al., 2015 and Iro-Idoro, 2018).

**Unwanted Sexual Attention** is any sexual attention that makes you feel uncomfortable or intimidated and can often result in victims experiencing health problems. Unwelcome sexual attention covers a vast range of behaviours from being touched without permission, causing fear, alarm or distress; sexual name-calling or harassment to rape and sexual assault. Unwanted sexual attention can happen to both women and men and between people of the same and opposite sex (Hantsweb, 2019).

**Sexual coercion** is an unwanted sexual activity that happens when you are pressured, tricked, threatened, or forced in a nonphysical way. Compulsion can make you think you owe sex to someone. It might be from someone who has power over you, like a teacher, landlord, or a boss. (Office of women health, 2019). This occurs when an employee is offered some job benefit such as promotion, pay raise, etc., in return for sexual favours or is subjected to some adverse action because of a refusal to submit to a request for sexual favours. In a relationship where sexual coercion is occurring, there is a lack of consent, and the coercive partner does not respect the boundaries or wishes of the other. This is often referred to as quid pro quo sexual harassment (Jimoh et al., 2015 and Iro-Idoro, 2018).

Hence, the objective of this study is to investigate the relationship between awareness of sexual harassment, namely; Sexual Hostility, Unwanted Sexual Attention and Sexual Coercion and Employees effectiveness in the organisation.
1.2 Statement of the Problem

Significant efforts have been made in addressing the problem of sexual harassment; the research has not been straightforward concerning its effect on the job performance of an employee. Despite the increasing interest in the different areas of employees’ related issues, job performance, effective and efficient performance, work ethics, compensation, training and development, etc. very little attention is given to sexual harassment of female staff in technical educational vocation as an essential factor in enhancing some of the employees’ related issues.

Employees in the educational sector often work long, irregular hours with alternating peak and slack times, which involve night; they are expected to have a better relationship with boss and colleagues for organisational success. In such conditions and situations, the line between appropriate and inappropriate familiarity may be crossed more easily (Siti et al., 2015). Therefore, employees who often report incidents of sexual harassment possibly exposed to the act due to some of these conditions. However, a study on sexual harassment of female staff for effective performance in technical vocational education is insufficient. Hence, it is essential to examine the various areas in sexual harassment and whether it significantly contributes to and determine the effectiveness of female employees' in technical and vocational education in Ogun State.

1.3 Hypotheses

H₀₁: Sexual Hostility of sexual harassment positively influences employees’ effectiveness.
H₀₂: Unwanted Sexual Attention positively influences employees’ effectiveness.
H₀₃: Sexual Coercion positively influences employees’ effectiveness.

2.0 Methodology

A survey design was adopted for the study, which consists of one independent variable sexual harassment and one dependent variable – employees’ effectiveness. Two-structured questionnaire tagged Situation-Specific Assessment of Sexual Harassment (SSASH) (Suzanne, 2001) and Questions for Operational Effectiveness (QOE) (Connie, 2013). A sample of one hundred twenty (120) female staff was randomly selected from three technical vocational educations in Ogun State (Federal University of Agriculture, Abeokuta, The Federal Polytechnic, Ilaro and College of Education Osiele, Abeokuta) currently in service of the institutions. In descriptive research, a sample size of 10-50% is acceptable (Mugenda & Mugenda, 2003). A sample of 120 questionnaires was distributed to female employees in various departments of the three selected Technical Vocational institutions in Ogun State, Nigeria and was completed and returned. Respondents were required to answer each item using four-Likert scale, ranging from 4 = strongly agree to 1 = strongly disagree.  Z-test at 5% level of significance was employed to test hypotheses for validating such sexual harassment and the efficiency of workers. The use of such a method was based on satisfying conditions of known population standard deviation, and sample size of the study was found higher than thirty.
3.0 RESULT AND DISCUSSION

3.1 Presentation, Interpretation and Discussion of Results

Out of the total one hundred and twenty (120) questionnaires administered, all the 120 questionnaires were returned yielding a retrieval rate of 100%. The Z-test statistic was performed, and the results displayed in Table 1. Hypotheses were tested using probability values from z-test analysis. From the result in Table 1, it was discovered that the use of sexual hostility and unwanted sexual attention are significant with the operational effectiveness of workers. This is confirmed by the rejection of null hypotheses formulated for meaningful strategies. However, the acceptance of the null hypothesis that the coefficient of sexual coercion is not significantly different from zero indicates that such is an insignificant sexual harassment determinant to the operational effectiveness of workers in the study area.

Table 1: Z-Test Result for Hypotheses Testing

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Z-value</th>
<th>P-value</th>
<th>H₀</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexual Hostility</td>
<td>120</td>
<td>2.551</td>
<td>1.234</td>
<td>9.433</td>
<td>0.000</td>
<td>H₀₁ = 0</td>
<td>Rejected</td>
</tr>
<tr>
<td>Unwanted Sexual Attention</td>
<td>120</td>
<td>3.282</td>
<td>1.268</td>
<td>6.908</td>
<td>0.000</td>
<td>H₀₂ = 0</td>
<td>Rejected</td>
</tr>
<tr>
<td>Sexual Coercion</td>
<td>120</td>
<td>3.539</td>
<td>1.148</td>
<td>3.550</td>
<td>0.073</td>
<td>H₀₃ = 0</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Source: Author’s Computation from STATA 12 Outputs, 2019

Decision Rule: If the p-value is less than the 5% level of significance, the H₀ will be rejected, but if the p-value is more than the 5% level of significance, the H₀ will be accepted.

H₀₁: Sexual Hostility of sexual harassment positively influences employees’ effectiveness.

Decision: The p-value of H₀₁ is 0.000, and this is less than the 5% level of significance. This means that the null hypothesis would be rejected.

H₀₂: Unwanted Sexual Attention positively influences employees’ effectiveness.

Decision: The p-value of H₀₂ is 0.000, and this is less than the 5% level of significance. This means that the null hypothesis would be rejected.

H₀₃: Sexual Coercion positively influences employees’ effectiveness.

Decision: The p-value of H₀₃ is 0.073, and this is more than the 5% level of significance. This means that the null hypothesis would be accepted.

3.2 Discussion of Findings

The current study developed and evaluated the relationship between awareness of sexual harassment, namely; Sexual Hostility, Unwanted Sexual Attention and Sexual Coercion and Employees effectiveness in the organisation. The result shows that sexual hostility has affected employees’ effectiveness on the job negatively. This means that female employees experience series of sexual aversion like telling original stories or jokes that were offensive, staff making crude and offensive sexual remarks e.t.c which sometimes embarrasses them and in return affect their efficiency and effectiveness. Jimoh et al. (2015) and Iro-Idoro, (2018) affirmed that when this behaviour is directed at an employee because of that employee’s sex, it adversely affects that employee’s ability to do his or her job.
Based on the result, the study shows that unwanted sexual attention has caused operational inefficiency of women in technical education. This implies that female employees in professional training usually experience unwanted sexual attention from either their male colleagues or boss despite an effort to discourage them from making advances. Touching and hugging without permission, asking for a date or drink during working hours are examples of female employees experiences. The result of this is directly on the effectiveness of the female employees, loose of commitment or interest in the organisation if not total withdrawal from the organisation (Gruber, 2003). Two different constructs usually measure removal, work withdrawal being late, neglectful, avoiding work tasks and job withdrawal that is turnover, or intention to leave the organisation (Hanisch & Hulin, 1990).

However, sexual coercion is found to be statistically insignificant, which induce sexual coercion does not have any effect on the operational effectiveness of women in technical education. This result may be due to strict implementation of legal action for misconduct by the management or understanding of the implications of such work by the employees since it is a formal and educational. The issue of sexual harassment has undoubtedly become more prominent in the last decade. As the increasing number of cases reported, many countries have taken legal action to recognize it as misconduct and at the same time to punish and prevent it. Sexual harassment has frequently been reported as a critical problem, particularly in educational institutions (Siti, 2015).

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusions

It may be concluded, from the preceding, that the combating sexual harassment for effective job performance of female employees in technical education needs to be geared towards other direction. Workplace sexual harassment is costly to employees and institution and is legally prohibited. Employees who are sexually harassed suffer a range of negative psychological and physical health consequences. Sexual harassment reduces individual and group effectiveness. Survey evidence shows that workplace sexual harassment is quite common. Much attention had been given to sexual coercion is it more noticeable and evident by the public. Indeed the management of the institutions had done a lot in the area of rape, duress and undue influence for abuse. However, the technical and vocational educations could pay much attention to other areas of sexual harassment in order not to create a hostile work environment and boost employees' effectiveness.

4.2 Recommendations

Prevention is the best tool to eliminate harassment in the workplace. Employers are encouraged to take appropriate steps to prevent and correct unlawful harassment, the researcher, therefore, recommends the following:

1. Employers are responsible for providing their staff with a work environment that is discriminate and free of harassment. Management of technical and vocational educations should continue to pay attention to the increasing cases of sexual harassment by creating policies directed at prevention rather than correction.

2. Employers should provide education and information about harassment to all staff regularly. Female Employees should be educated and sensitized on the types of sexual harassment that goes on in the workplace and the techniques to prevent it from happening.

3. Employers should provide a mechanism for addressing sexual harassment confidentially and sensitively after the staff has filed a grievance.

4. Employers should establish a valid complaint or grievance process, providing anti-harassment training to their managers and employees, and taking immediate and appropriate action when a female employee is harassed.

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CURTAILING SEXUAL HARASSMENT IN TECHNICAL AND VOCATIONAL EDUCATIONAL INSTITUTIONS IN NIGERIA

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ABSTRACT
Sexual harassment is not peculiar to Nigerians alone, it appears to have established itself as a norm in the society today. Considering its high incidence in our tertiary Institutions, places of employment and places of worship. It has become a contemporary challenge in our higher institutions of learning; hence the need to draw the attention of the public to the cankerworm that is now one of the biggest threats to the development of education and academic excellence in our society.

In a bid to curtail the wave of sexual harassment and its concomitant effect; this paperwork is armed at identifying forms of sexual harassments; the multiplying effects on victims and suggesting possible solutions to the problem of sexual harassment.

Keywords: Sexual Harassment, Tertiary Institution, Policy Statement, Mental Re-orientation and Quid Pro Quo.

1.0 INTRODUCTION
Sexual harassment in the Nigerian tertiary institutions is not a new phenomenon. Over the years, it has increasingly received widespread attention in the media, consequently resulting in a dramatic increase in public awareness. There has also been several research works carried out to address issues relating to sexual harassment in tertiary institutions.

Sexual harassment is one of the many social vices plaguing our higher institutions of learning as well as the society at large. Hence, there is need to draw the attention of the public to cankerworm that is silently eroding academic excellence in our tertiary institutions. The school system has the responsibility to ensure that it creates a safe and conducive environment for learning for all of its students.

This paper examines sexual harassment from a solution focused perspective. It specifically focuses on the definition of sexual harassment, the forms of sexual harassment in tertiary institutions, the effects of sexual harassment on victims; and also offers strategies to curtail sexual harassment in institutions of leaning.

Tertiary Institution
Tertiary Institution, more commonly referred to as post-secondary education, refers to the third place of learning after graduating from high school or secondary school in the Nigerian context. Nigeria is one of the countries with many tertiary institutions in the world. These institutions include universities, polytechnics, monotechnics and colleges of education. Tertiary Institutions have come a long way, in building, guiding and growing intellectuals and reputable leaders who are equipped to drive the change and innovation required for economic growth and development through their intellectual prowess.
Sexual Harassment

Sexual harassment is an unwelcome sexual behaviour that is offensive, humiliating or intimidating. It can be written, verbal or physical, and can happen in person or online.

Within the context of an academic environment, sexual harassment can be regarded as enforcing through bullying or coercion, unwelcomed sexual advances, requests for sexual favours, and other verbal or physical sexual advances conduct in exchange for employment, academic performance or better living condition.

It is a very demeaning and inappropriate act, particularly because the perpetrators are authority figures and models to the students who are most often their victims.

Menon et al. (2011) described Sexual Harassment as unwanted sexual advances, requests for sexual favours, and other verbal or physical conducts of a sexual nature, when submission to or rejection, explicitly or implicitly affects a person's employment or education, unreasonably interferes with a person's work or educational performance, or creates an intimidating, hostile or offensive working or learning environment.

Sexual Harassment can take the following forms:

- touching, grabbing or making other physical contact with you without your consent
- making comments to you that have a sexual meaning
- asking you for sex or sexual favours
- leering and staring at you
- displaying rude and offensive material so that you or others can see it
- making sexual gestures or suggestive body movements towards you
- cracking sexual jokes and comments around or to you
- insulting you with sexual comments
- Committing a criminal offence against you, such as making an obscene phone call, indecently exposing themselves or sexually assaulting you.

TYPES OF SEXUAL HARASSMENT

There are two key categories of sexual harassment which are “quid pro quo” and a hostile environment.

Quid Pro Quo

Quid pro quo literally means “this for that” in Latin. Other similar interpretations are: "give and take", "tit for tat", "you scratch my back, and I'll scratch your back." Quid pro quo sexual harassment happens when it is stated or implied that an academic performance of a student depends upon whether the student consent to conduct a sexual act.

Hostile Environment

A hostile environment sexual harassment occurs when an unwanted sexual conducts creates an intimidating, threatening or hostile working or learning environment or its severe, persistence or pervasiveness affects a person's ability to participate in or benefit from an academia program or activity. The learning environment is considered hostile, when a staff, does or says something discriminatory that unreasonably interferes with an individual's educational experience or creates an intimidating environment.

When submission to or rejection, explicitly or implicitly affects a person's employment or education, unreasonably interferes with a person's work or educational performance, or creates an intimidating, hostile or offensive working or learning environment, Menon et al. (2011).
SEXUAL HARASSMENT WITHIN TERTIARY INSTITUTIONS

Sexual harassment permeates all levels of education – down to nursery school. Sexual harassment has been in existence in the school system for several years. Hence, sexual harassment is not an emerging trend in Nigerian tertiary institutions. Studies have shown that sexual harassment in education is higher in countries with weak educational systems, low levels of accountability, high level of poverty and gender inequality. It was further discovered that sexual harassment is more prevalent in institutions where educators are poorly trained, underpaid and severely under sourced (Beninger, 2013; Lynch, 2013 and Sharma, 2013).

In one survey of female graduates in Nigeria’s higher institutions, at least 69.8 per cent said they had been sexually harassed by their lecturers and male classmates. It added that about two-thirds experienced the non-physical sexual harassment (in the form of sexual comments and requests to do something sexual in exchange for academic favours); 48.2 per cent experienced physical sexual abuse. But statistics only scratches the surface of the ugly practice. Lawal I. (2018)

Another survey of female undergraduates with a focus on experiences of sexual harassment while in their various tertiary institutions in Nigeria higher institution revealed that the majority (69.8%) of the respondents had been sexually harassed, with the main perpetrators being male classmates and lecturers. About two-thirds experienced the non-physical type of sexual harassment; 48.2% experienced the physical type. Non-physical harassment included sexual comments (57.8%) and requests to do something sexual in exchange for academic favours (32.2%). Physical forms of sexual harassment included unwanted sexual touching (29.4%) and being intentionally brushed against in a sexual way (28.9%). Owoaje, E.T & Olusola-Taiwo, O. (2011)

The increasingly wide spread use of social media in Nigeria, has given more women a platform to be more outspoken on their experiences with sexual harassment. Social media trends such as the #MeToo movement where victims share their experiences with sexual harassment has further revealed the prevalence of sexual assault in our institutions and shone light on its silent culture.

EFFECTS OF SEXUAL HARASSMENT

The effects of sexual harassment can be profound, and can range from uncomfortable to severe distress. If unchecked, female students would carry physical, emotional and mental scars that will affect their academic performance and likely their future relationships with the opposite sex which can last for a short or long time.

For victims, being sexually harassed can have demoralizing effects on Physical well-being, Psychological health and education. Psychological effects include: depression, denial, anxiety, shock, anger, frustration, fear, irritability, insecurity, embarrassment, shame, guilt, self-blame, isolation. Physiological effects include: headaches, lethargy, weight fluctuations, nightmares, panic reactions, sexual problems. Effects on education: include absenteeism, withdrawal from school, drop in academic performance due to stress. North Michigan University (2019).

Sexual harassment can also generate a "ripple effect" of negative impact on the overall development of Nigeria itself as a nation in achieving sustainable development.

The issue of sexual harassment is a threat to achieving the girl child education. It has created non conducive and unsafe learning environment for the female students which has promoted slow and uneven progress towards attaining gender equality of the Sustainable Development Goals (SDG) that it is detrimental to sustainable development. Therefore, it is pertinent to note that sexual harassment is a threatening social phenomenon in the Nigerian educational sector; which has severe psychological and social consequences on the victims as well as economic and political consequences on the nation in achieving sustainable development. Mohammed (2017)
CURTAILING SEXUAL HARASSMENT IN NIGERIAN INSTITUTIONS

The main reason for the continuous perpetuation of this cruel act is the existence of weak mechanisms and redress in tertiary institutions. Unfortunately, sexual harassment weakens the integrity of the ivory towers.

The primary responsibility of curtailing incidences of sexual harassment in tertiary institutions falls on the leaders of these institutions who have the will to rid their campuses of sexual harassment. Therefore, it is the responsibility of the management of all the tertiary institutions in Nigeria to reduce the occurrences of sexual harassment to the lowest possible rate in order to create an environment that is conducive for female students.

2.0 CONCLUSION AND RECOMMENDATIONS

2.1 Conclusions

Considering the current rape cases being discussed on media, there is no better time than now for higher institutions to check within and evaluate their current policies and also put corrective and remedial measures in place to curtail this menace. Not only does sexual harassment affects the victims physiologically and psychologically, its ripple effect on sustainable economic development cannot be overlooked. Sexual harassment is a threat to attaining gender equality of the Sustainable Development Goals (SDG) which is detrimental to sustainable development.

2.2 RECOMMENDATIONS

6. A clear and comprehensive policy statement on sexual harassment which should be effectively communicated to all stakeholders including faculty and students. A policy statement on sexual harassment is a documented message from the management to all staff and students expressing the institution’s policy, and commitment to prevent and eradicate sexual harassment in order to create a positive and conducive working environment in the organization. The policy statement should come from the top management to ensure its acceptance and compliance. The policy should include at least the following elements:

a) A clear definition of sexual harassment. A detailed definition is necessary to ensure that faculties as well as the management have a clear idea of conducts that constitute sexual harassment. The main objective of the definition is to make individuals in the institution fully aware of certain conducts and attitudes that can be regarded as unwelcome and offensive to others, and therefore prohibit such conducts in the institution.

b) A complaints/grievance procedure. Due to the sensitive and personal nature of sexual harassment complaints, the management should put together a separate complaint procedure to deal specifically with sexual harassments related complaints. A complaint procedure should provide for measures to protect victims from further embarrassment in the course of reporting and investigation into the complaint. A complaint procedure should contain at least:

- a step-by-step procedure for reporting and processing of a complaint with a suitable time limit for each step;
- an investigation procedure;
- and an appeal procedure to enable dissatisfied party to appeal against the outcome of an investigation to a higher authority

c) Disciplinary rules and penalties against the perpetrator and against those who make false accusation. To ensure that the policy and mechanism to prevent sexual harassment is effective, it is essential that offenders be disciplined. The disciplinary rules should set out the penalties to which the offender will be liable if the offence is committed. The nature and type of penalty should depend upon the severity of the offence. To defer false and fabricated accusation against any person, the rule should also set out disciplinary penalties against those who make such accusations.
d) **Protective and remedial measures** for the victim. To encourage victims to report sexual harassment, there should be adequate measures to ensure maximum confidentiality so as to minimise embarrassment to the victim especially at the time of reporting and in the course of investigation into the complaint.

7. **Prevention is the most effective instrument** that tertiary institutions can use to combat sexual harassment in tertiary institutions. It is not sufficient to simply develop an institutional policy and preventive mechanism on sexual harassment, the dissemination of the policy among the stakeholders is quite important. This can be done through communication, education and training. Promotional and educational programmes should be put in place to communicate the institution’s policy on sexual harassment and to raise awareness on sexual harassment and its adverse consequences within the learning community. In addition to the need for communication, the institution should provide a programme by which faculties and students can be educated in the area of sexual harassment. The institution should relate issues on how to deal with them as and when they arise. The need for training is particularly more important for those who have been assigned to function as disciplinary panels and counsellors.

8. **Partnerships and Collaborations.** No culture change or education initiative can be implemented successfully, anyway in a silo. These efforts require partnerships and collaboration. Partner with external organizations such as the Mirabel centre. The Mirabel Centre is a Sexual Assault Referral Centre located in Lagos, Nigeria and established to provide holistic and high quality medical and psychological services to survivors of sexual assault and rape.

9. **New students’ on boarding course.** New intakes of students at the Tertiary Institutions should also be mandated to complete a general class on sexual harassment during their first semester of school.

5. **The Need for a Mental Re-Orientation:** An effective and lasting solution to this problem is a massive re-orientation of the Nigerian citizenry starting from the family units to the schools, churches and also the media. This way, proper social values such as decent dressing and sexual discretion can be encouraged.

6. Regardless of who is involved as the harasser, it is important that we call out inappropriate behaviours witnessed in the work place. If there are more people calling out inappropriate behaviours, then it is more likely that it would have the effect of shaming intending harassers into checking their behaviours.

7. Policies regarding sexual harassment should be clearly articulated and visible all over the institution to stand as a reminder that sexual harassment of any form will not be tolerated. If all these are done, the high incidence of sexual harassment would be reduced to a level and many people especially the parents will heave a sigh of relief. Ultimately it is up to all of us to come together to change the culture of pervasive sexual harassment in Nigeria, especially in the workplace.

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RECOMMENDER SYSTEM FOR CLASS SELECTION IN SENIOR SECONDARY SCHOOL

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ABSTRACT

Recommender system for subject selection is a computerized system to deal with day to day operations taking place in school that helps student choose wisely and correctly what part or way to follow concerning what field they intend venturing into, whether in the science, commercial or art, based on their grades or how well they have done in Junior school. This paper aimed at designing a system which is a subclass of information filtering system that seeks to predict what the student might likely fall under to assist in making decision, because making good choices may require considerable effort and expertise, designing “intelligent” components that can make informed recommendations about solution development will play a valuable role in realizing the full potential of the student.

Keywords: Recommender System, Knowledge Based System, Information Filtering System

1. INTRODUCTION

Recommender system is a subclass of information filtering system that seeks to predict the “rating” or “preference” that a user would give to an item with ability to offer something similar to it. It has the ability to predict whether a particular user would prefer an item or not based on the users profile or activities. In a recommender system, there is an aspect of cased based reasoning that is broadly construed, which the process of solving new problems based on the solutions of similar past problems. A cased based reasoning is the act of developing solutions to unsolved problems based on pre-existing solutions of a similar nature that has occur in the past and using it in judgment for the current situation. The goal of a recommender system is to generate meaningful recommendations to a collection of users for items or products that might interest them.

2. LITERATURE REVIEW

A recommender system is a software system that proposes a path to a user based on the previous activities or task carried out. A recommender system traditionally just like any computer system has been most adept in accepting data, processing and then recording the results typically to a searchable database. Also, according to Barkat (2015) he sees recommender system as a system that produces individualized recommendations as output or has the effect of guiding the user in a personalized way to interesting objects in a larger space of possible options.

In general, recommender methods are usually grouped into four broad categories, based on how recommendations are made. Collaborative system approach, Content-based, knowledge based and Hybrid recommender approaches. An excellent survey of different recommender systems for various applications can be found in pure content-based recommender methods typically propose items to a target user based on affinity between items’ contents and the user profile, ignoring data from other users.

On the other hand, in pure collaborative recommender methods, items are recommended to a target user based on similarities with other users’ preferences (example: purchase histories and user ratings), ignoring items’ features. The greatest strength of collaborative techniques is that they are completely independent of any machine-readable representation of the objects being recommended and work well for complex objects where variations in taste are responsible for much of the variation in preferences. Collaborative filtering is based on
the assumption that people who agreed in the past will agree in the future and that they will like similar kind of objects as they liked in the past (Barkat, 2015)

Kaut (2008) Knowledge-based methods use deep knowledge about features of items rather than users’ ratings. Knowledge-based recommender methods exploit inferences, often adopting techniques from artificial intelligence, to deduce a match between user and item. In this type of system, the algorithm takes into consideration existing knowledge about individuals and tries to match an item with such individual based on existing preference. The knowledge base consist of history and activities of individuals stored over a period of time, this is then used to predict or recommend a type of service or item to a user of the system, based on inference drawn. Furthermore, the knowledge based recommender system also takes into cognizance the behavior and pattern of interest of such individuals and its affinity.

Hybrid Recommender System is the approach in which any two systems are combined in a manner that suits a particular situation. This is approach is mostly used by many companies as it combines the strengths of more than two Recommender system and also eliminates any weakness which exist when only one recommender system is used. There are several ways in which the systems can be combined, such may include but not limited to Weighted Hybrid Recommender, Switching Hybrid Recommender and Mixed Hybrid Recommender.

3. METHODOLOGY
   I. **Inference Engine**: The inference engine is used for logical deduction, starting from the inputs facts, intermediate facts with encoded deduction rules that works on knowledge base.
   II. **Functional Knowledge**: This is about how a particular item meets a particular user needs
   III. **User Model**: The system was designed based on the affinity between students and subjects taken from junior school with Junior WAEC as the final metric used. The subjects taken at each level is stored in knowledge base and each scores for various subjects is evaluated to test the strength of the student with aggregate recorded. The results is then compared to the Junior WAEC result to determine the option of the class such student would be placed

![Figure 1: Proposed System Architecture](image)

The proposed architecture is interlinked with a knowledge base that contains all the data generated by the students and also case specific database where all the inference drawn from data is stored. Data flow through the system from knowledge engineer with inbuilt subsystem with capability to clean the data before been stored in knowledge base. The inference engine works with predefined logic rules to the data drawn from knowledge base of the system and display the information to the user interface.

It is expected that with the introduction of the new system, a lot of positive changes will be noticed. In the design of the software, conscientious effort is made to create an effective knowledge based system which would be successfully implemented into the workflow, providing the staff with the necessary support in their yearly activity of recommendation. The system will significantly improve staff and workers performance and improve students outcome hence allowing them work hard to want to get to their desired department since it’s a system that decide for them.
The use case diagram shows the interaction between the administrator and the Guidance Counselor with the system.

4. RESULT AND DISCUSSION
   LOGIN PAGE: Figure 3 shows the page that allows the ADMIN to login into the software so as to be able to register the student. Also it is the entering of information into a system by a user in order to access that system.
REGISTRATION FORM: Figure 5 is the form that allows the input into the database. The staff fills in the details of the student and save it for processing.

RESULT PROCESSING FORM: The figure 6 displays the result of grades filled in.

RESULT (OUTPUT) FORM: The result the form that shows the output of the processed data (grade) of the student. It shows the percentage of the performance of the student in hierarchy. Then the guidance counselor can see what department (art, commercial or science) the student is most likely to fit in.
5. CONCLUSION
The program aids an easier record keeping of students for quick access process, update, retrieval and storage of records for use and future reference. In terms of speed, the program gives faster access to any data and aids in the improvement of the standard of decision making. Also, the reliability of the program is well guaranteed due to the fact that data entered interactively to the computer are saved in files and duplicated to other external disk at choice, meanwhile records can be adjusted by authorized bodies. The system also allowed reports and forms to be printed. Most importantly every student knows he or she has to make a particular grade to be in a particular department he or she prefers but now that a system is having to decide for them, it would make them be eager to learn and work hard.
The system is recommended for department selection of student at the senior class level of secondary school in Nigeria as well as the Ministry of Education at both State and Federal levels.

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CONTENT ANALYSIS OF SELECTED GOVERNMENT WEBSITES USING LAYNE AND LEE MODEL

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ABSTRACT
Information and Communication Technologies (ICT) is a vital tool in Nation building and development. E-government is presently growing to become a major means of using ICT to improve the activities of public sector organizations. Based on some parameters such as transparency, interactive, accessibility and usability, this study revealed that some government websites are not properly working. Hence, there is need to evaluate e-government websites to find out how developed these websites are and to make suggestion were necessary on the way forward. This study employed the survey design which cut across some selected ministries’ official websites in Lagos, Ogun, Cross Rivers and Kaduna based on functions they perform. This study used content-based to examine the content of the selected websites and Layne and Lee stages model were used to examine the ministry that perform better. Results showed that all the ministries examined have functional website. But some ministries had developed faster than others based on the Layne and Lee Stages model. Based on these findings it is recommended that Government should have a peer review mechanism policy in all the states ministries to move at the same pace, so that Nigeria will be ranked high in e-government index which is now a yardstick for measuring development around the world.

Keywords: E-government, Layne and Lee Stages model, Content-based Analysis, Public agencies.

1.0 INTRODUCTION
Electronic government refers to government’s use of technology, particularly web-based Internet applications to enhance the access to and delivery of government information and service to citizens, business partners, employees, other agencies, and government entities. It has the potential to help build better relationships between government and the public by making interaction with citizens smoother, easier, and more efficient. Indeed, government agencies report using electronic commerce to improve core business operations and deliver information and services faster, cheaper, and to wider groups of customers (Layne and Lee, 2001).

There is an all-encompassing excitement in most developed and developing countries concerning the role of information and communication technology (ICT) in transforming a government from a sluggish and non-responsive leviathan to a citizen-friendly and responsive institution. Rapid progress in Information and communication Technology (ICT) has enabled the development of applications such as: e-commerce, e-learning, e-health and e-government Governments around the world are recognizing the value of e-Government. Properly designed and implemented, e-Government can improve efficiency in the delivery of government services, simplify compliance with government regulations, strengthen citizen participation and trust in government, and yield cost savings for citizens, businesses and the government itself. Not surprisingly, therefore, policymakers and managers are looking to adopt e-Government in countries around the world ranging from the most developed to the least developed (Getrude and Japhet, 2012). E-Government, therefore, is to provide efficient dissemination and management of information to the citizen; better service delivery to citizens; and empowerment of the people through access to information and participation in public and policy decision-making (Getrude and Japhet, 2012). Despite these, literature suggests that many e-government initiatives have not been completed successfully, especially in the developing world. Sixty to eighty percent of e-government projects fail or do not achieve their goals (Heeks, 2002; UN, 2008a). Many studies revealed that e-government initiatives must take into consideration the variety of government systems, technological infrastructure, culture, political, and economic settings. The creation of government websites is seen generally as a first step towards implementing full e-government strategies (Layne and Lee, 2001; Netchueva, 2002; Silcock, 2001). The focus of this study is to examine the functionalities of government websites which provide citizens with opportunities to interact with their governments, access services and information that have not been possible in traditional forms of government-citizen communication.
2.0 OVERVIEW OF E-GOVERNMENT

E-Government has been a means of using the internet and the world-wide-web for delivering government information and services to citizens of the country, business organizations and other government parastatals. It also being described as the use of information and communication technologies (ICT), particularly, the Internet, as a tool for delivering better government services to the citizen.

Different studies have provided numbers of overview of e-government, among these studies are:

Adeyemo, (2013), viewed the primary aim of e-government as a way of ensuring the application of e-governance in the affairs of the populace in order to promote good governance which is characterized by equality in the democratic process, transparency, and accountability in the various sector of the nations’ economy. E-governance evolved on the basis of the revolution in information and communication technology which finds expression in digital technologies such as; personal computers, internet, mobile phones, and different electronic applications. The emergence of these devices gradually enabled the easy transfer of information and services between the government and other areas of the society (Danfulani, 2013).

Willie (2011) established that information and communication technology has been described as the tools for changing the society electronically. The global community views electronic governance as a more acceptable and reliable means of delivering government services through the utilization of information and communication technology which will enhance transparency, and ensuring the provision of adequate information to citizens. This improves efficiency in administrative processes and ensuring availability of public services to the citizens.

Branen, (2001), view the primary focus of e-governance as means of ensuring a stress-free of its citizens to access government services. Thus, the author ascertained that the cumbersome process of following bureaucratic processes in e-government must be avoided at all cost.

Danfulani, (2013), viewed the scope of e-governance as a way to revolve around e-registration, e-taxation, e-mobilization, e-education, e-service delivery and the analysis of public financial statements using web applications. Thus, e-government serves as a network of organizations which includes both profit and non-profit organizations, and private institutions who work together to achieve a common goal.

3.0 METHOD AND MATERIALS

Content analysis using a directed approach is guided by a more structured process than in a conventional approach. This study view set of Website pages as a web graph, that is, a graph

\[ G = (V, E) \]

in which the set \( V \) corresponds to website pages in a subset of the web, and every link \((x, y) \in E\) corresponds to a hyperlink from page \( x \) to page \( y \) in the collection. For concreteness, the total number of nodes \( N = |V| \) in the full website is in the order of \( 10^{10} \) and the typical number of links per website page is between 20 and 30. This study examined the content of government websites of selected states which include Lagos, Ogun, Cross Rivers and Kaduna to determine the functionality of these websites. The approach used help to interpret meaning from the content of each website. The figure 1 depict the steps of the approach used.

![Figure 1: System Architecture](image-url)
3.1 Scope used to examine the content of the website include information, two way communication, transaction, integration and political participation

3.2 Layne and Lee Model

The study used Layne and Lee model as a response to functionality of services rendered by each level of government, services need by citizens and customers/clients expectations. Layne and Lee model is depicted in figure 2.

Figure 2: Layne and Lee Model (Layne and Lee, 2001)

4.0 DATA ANALYSIS AND RESULT

This study visited some government websites to examine functionality of these websites and the use of information and technology in government (i.e. accessibility of government services to the citizens). The ministries covered include:

- Ministry of Justice
- Ministry of Labor & Productivity
- Ministry of Information
- Ministry of Education
- Ministry of Power, Works & Housing
- Ministry of Petroleum
- Ministry of Agriculture
The extracted data from websites these ministries were depicted in table 1.

<table>
<thead>
<tr>
<th>MINISTRY</th>
<th>TRANSPARENCY</th>
<th>INTERACTIVITY</th>
<th>ACCESSIBILITY</th>
<th>USABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Justice</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Labor &amp; Productivity</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Information</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Education</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Power, Works &amp; Housing</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Interior</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Finance</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Science &amp; Technology</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

This study used usability, accessibility, transparency and interactivity as a parameter to determine the use of information and technology in the government agencies covered. It was found out that usability, accessibility, transparency and interactivity were held in all the ministries covered in the study because interaction with all the websites was clear and understandable. It was also observed that these websites were easy to operate and navigate.

But, since this study left some ministries uncovered there is still strong believed that some ministries perform better than the other.

The result shows that some government agencies have a well-developed website which is fully function by providing latest information about the government service to the citizen. Thus, the use of information and technologies allow fully participation of citizens in government.

5.0 CONCLUSION AND FUTURE WORK

5.1 Conclusion

This study examined the use of information and technology in government. It was revealed that the use of information and technologies have been adopted in various level of government. This allows more participation of citizens in government.

5.2 Future Work

Future research direction in this study is to examine larger sample of states and see whether the issues of transparency and interactivity will hold.
References


INSURANCE AS AN IMPETUS FOR ECONOMIC DEVELOPMENT IN NIGERIA

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ABSTRACT
The insurance sector has contributed little or no effect in its role of mobilizing funds effectively and efficiently for productive investment which could lead to economic development. The study aims at investigating the impact of insurance business on the development of Nigerian economy. Secondary data were sourced from the Central Bank of Nigeria (CBN) statistical bulletin (2017), was used for the study and the time series data covered the period of 27 years ranging from 1991 to 2017 was implored. Ordinary least square regression was adopted with the aid of Econometric View 7 to analyze the data. The study reveals that life insurance premium and non-life insurance premium are statistically significant at 5% level of significant, which indicates that life insurance premium and non-life insurance premium have significant impact on the gross domestic product, while total insurance investment does not have significant impact on the gross domestic product. The study therefore concluded that, insurance company has a significant but negative association to economic growth and based on the above findings, we hereby recommended that government should ensure a compulsory insurance policy to be mandated on employers and vehicle users, authority and NAICOM should look into the investments of the insurance companies so as to ensure transparency, avoid unnecessary extortion and ensure fair dealings in order to actualize the sectors objective and hence, promote economic growth of our country Nigeria.

Keywords: Insurance Company, Life insurance, Non-Life insurance, Total investment, Economic Growth

1. INTRODUCTION
The role of insurance investments in promoting economic growth cannot be overemphasized. In the last few decades, Insurance Industry is one of the major sectors of the Nigerian economy and plays a significant role as the bedrock of nation building particularly to develop sustainable means of improving national economic growth. It provides insurance covers to the insuring public vis a vis agricultural sector, commerce and industry, oil and gas, corporate organizations, individuals and government (Tijani, 2015). The business of the insurance industry is such that it provides services in the form of security against unforeseeable contingencies which are likely to occur in everyday activities, thereby result in liabilities that metamorphosed to a financial loss (Olayungbo, 2015). These services are usually provided by the insurance company to the insured in return for a given small consideration known as a premium, which basically serve as the central source of insurance funds and also if well invested in it, lead to industrial profit. Furthermore, the premium contributed to the pool is used in the settlement of claims to indemnified the insured whenever loss occur and the residual will be reinvested to yield higher proportionate in return as profit to the organization (Omoke, 2011). In Nigeria, we have two types of insurance business, Life insurance and Non-Life insurance. Life Insurance provide a sum of money(sum Assured) on the premature death of the life assured or permanent disability of the assured, to provide for the assured family or beneficiary (Raji 2018). Akinpelu2003 opined that Non-life insurance is a short term insurance business which provide cover to the property of the insured and indemnified the insured whenever loss materialized. Every human being is faced with the possibility that one or more of the adventures which form part of life will sooner or later befall him and cause him some financial loss. According to that person’s position in the society, the loss may be very small or very large. If a villager’s shanty or a chief abode is damaged by fire, he can replace it simply by gathering the necessary building materials from the forest outside his door or in neighboring community (Irukwu, 1971)

However, a big modern company is damaged by fire e.g. bottling company, the cost of repairs may be enormous and would involve the purchase of equipments from abroad, the maintenance of personnel during repairs, loss of profits as a result of delays in production, compensation to injured employees, and other taxing responsibilities which the factory owner would be ill-prepared to meet at a time when his asset are in debris as a result of the fire (Deolu, 2004). Some people may be favorable, and live all their lives without suffering any serious calamity or misfortune, but even the few lucky ones, cannot, at any one moment say with certitude, that misfortune will never fall on them. Quite apart from those financial disasters which may or may not happen, there are many...
hazards which are also completely beyond human control. For example, the family bread winner knows it is beyond his control to prevent death from coming his way. He knows he will die sooner or later, but he is uncertain as to when he would die. If he dies at an early stage, his family would suffer some financial loss should the bread winner loss his earning power as a result of an accident. The level of growth and development which should be commensurate with Nigeria’s huge potentials has not been attained and may never be attained since independence Oluoma, (2010). Thus as opines by Oluoma (2010), several factors have been advocated for this lack of growth of the Nigerian economy and among such notable factors is inadequate funding for investment purposes which have bounded insurance premium to have effect on the Nigeria economy. The major role of an economy’s financial sector is helping to channel resources from surplus unit to the deficit units for investment. Therefore, the financial sector improves the screening of fund seekers and the monitoring of the recipients of funds, thus improving resource allocation, mobilizes savings, lowers cost of capital via economies of scale and specialization, provides risk management and liquidity. Insurance companies could play a major role in these functions if properly managed, thus supporting economic growth. However, in Nigeria, based on the nation’s experience of stunted growth; the insurance sector has not actually contributed meaningfully in its role of effectively mobilizing funds for productive investment which could lead to growth and development of Nigeria economy. The major functionality of the insurance on the client side is risk transfer. Usually the insured pays a premium and is secured against a specific uncertainty. By reducing uncertainty and volatility, insurance companies smoothen the economic cycle and reduce the impact of crisis situations on the micro and aggregate macro level. The challenges encountered by the insurance sector make it impossible for the sector to effectively and efficiently exercise its maximum power economically, as a result of poor awareness of the sector product. Prior to these problems, the study aims at evaluating the impact of insurance company on the growth of Nigerian economy.

Objective of the Study
The broad objective of this study is to evaluate the impact of insurance industry to the growth of Nigerian economy. The primary objectives are to:

i) To examine the impact of life-insurance premium on economic growth of Nigeria.
ii) To examine the impact of Non-life insurance premium on economic growth of Nigeria.
iii) To evaluate the impact of total insurance premium on economic growth of Nigeria.

2. LITERATURE REVIEW

Concept of Insurance
In defining insurance business Scholars has aggregate the fact that insurance business guarantees the entrepreneur and promoters of innovation to take risks that is necessary to make life better and not get burn in the process, Adebisi (2006) posited that insurance is a complicated issue which involve economic and social device for the handling of risks to life and property. He explains that it is social in nature because it represents the cooperation of various individuals for mutual benefits by combining together to reduce the consequence of similar risks. As every new area of risks and since with every passing day a new insurance package is amounted to take care of more and more areas of risks, the insurance booms. Akinlo (2013) defined insurance as a legal contract or a legal contract which is an agreement between two or more parties who are legally bound to fulfill a promise or a number of promises contained in the contract deed. He further posited that insurance can be classified as a contract made by a company or society, or by the state, to provide a guarantee of compensation for loss, damage, illness, death and so on in return for regular payment. But Agbaje (2005) defined insurance as the business of pooling resources together to pay compensation to the insured or assured (i.e. the policy holder) on the happening of a specified event in return for a periodic consideration known as premium.

Insurance can generally be defined as the pooling of funds from the insured (policy holders) in order to pay for relatively uncommon but severely devastating losses which can occur to the insured. It is a contract between two parties whereby one party called the insurer undertakes to pay the other party called the insured a fixed sum of money on the occurrence of a certain event. Obasi (2010) defines insurance as “a contract between the person who buys insurance and an insurance company who sold the policy”. He opines that by entering into the contract, the insurance company agrees to pay the policyholder or his beneficiaries a predetermined sum of money in any case of any unfortunate event for a predetermined fixed sum payable which is referred to as the premium. In Nigeria, different types of insurance products are available include: fire, marine, aviation and transit, life covers, health, oil and gas insurances amongst others (Mojekwu, Agwuegbo & Olowokudejo, 2011).
General or Non-Life Business
This is a contract between an insurer (i.e. the insurance company) and the insured where by the insurer undertakes to indemnify the assured against losses, which may result from the occurrence of specified events within specified periods. General insurance business can be sub-divided into: fire, accident, oil and gas, contractors’ all risks and engineering risks; marine and Credit insurance, bond and surety ship etc. This is a contract between the assured (the company) and the assured (i.e. the policy holder) whereby the insurer undertakes to pay benefits to the policy holder on the attainment of a specified event. They type of insurance is long term in nature.

Life Assurance Business
Life Insurance provide a sum of money(sum Assured) on the premature death of the life assured or permanent disability of the assured, to provide for the assured family or beneficiary (Raji 2018). Life assurance comprises individual life business, group life insurance, pension business, health insurance business and annuities.

Evolution of Insurance in Nigeria
The beginning of insurance in Nigeria is highly connected with the advent of British trading company in the region and the subsequent increased inter-regional trade. During this period, shipping and banking activities increase due to increased in trade and commerce. It therefore became expedient for some foreign firms to handle some of their risks locally (Uche and Chikeleze, 2001). Trading companies in Nigeria were granted insurance agency licenses subsequently by foreign insurance companies. Such licenses made it possible for such firms to issue covers and assist in claims supervision. In 1918 Africa and East Trade Companies introduced the Royal Exchange Assurance Agency, followed by other agencies such as Patterson Zochonis (PZ) Liverpool, London and Globe, BEWAC’s Legal and General Assurance and the Law Union and Rock (Osoka, 1992). In 1961, commission was set up to review the situations in the insurance industry and also to come out with recommendations. The outcome of commission gave rise to establishment of Insurance Companies Act of 1961. In 1969, fifty insurance companies have been established in Nigeria, though with foreign domination. The foreign domination made the Federal Government of Nigeria became skeptical as to what future holds for the then insurance industry, which was generally dominated by the foreigners even as Nigerians were not allowed to hold sensitive positions which would have equipped them for managerial or technical responsibilities in the industry. As a result of this, a parliamentary committee was therefore set up in 1964, under the chairmanship of honourable Obadan, for second time to look into the foreign domination of insurance. In the end, Obadan committee’s recommendation could not go beyond sensitization of Government over the danger inherent in the foreign domination of insurance industry.

Insurance and Economic Growth
Over the years, the insurance sub-sector has witnessed some significant growth worldwide. According to Beck and Webb (2003), the share of this sector in the financial sector has been increasing as reflected in the volume of business of the insurers. Theoretically, the various channels through which insurance can positively impact economic growth include mobilization of domestic savings, efficient management of different risks, mitigation of losses, more efficient allocation of domestic capital and promotion of financial stability (Skipper, 2001; Beck and Webb, 2003; Akinlo, 2013). Ward and Zurbruegg (2000) and Kugler and Ofoghui (2005) assert that in offering risk transfer, indemnification for unexpected large losses, financial intermediary services and real services, insurance markets have had a significant productive impact within economies. For instance, insurance can help to promote strategic investments in productive assets by providing surety to investors and other contractual claimants (such as banks) to protect the value of their investments against unanticipated severe losses (Adams, Anderson, Anderson, and Lindmark, 2000). Crothers (2004) contends that post-independence insurance (particularly marine insurance) was instrumental in the economic development of the slave-owning states of the US. For instance, the development of a domestic marine insurance market enabled the Southern US to provide cost-effective risk protection for their exports of agricultural and associated industrial products without recourse to Lloyds of London. This exemplifies that insurance helped to stimulate economic growth and sustain the regional slave-based economy up to the end of the Civil War in 1865.
Theoretical Framework

Markowitz Portfolio Theory
The Markowitz efficient behavior exhibited by insurance companies while investing is usually associated with preference for more returns on investment to fewer returns, also risk on investment as directly depending on the size of expected returns as such it is the framework that underpins this study as it is used in evaluating the performance of managed portfolios. It provides gratifying predictions about how to envisage risk on investment as directly depending on the size of expected returns. Since the goal of any investment is to generate returns and ensure that expected returns on the investment funds is higher than the associated risks to be able to meet their long term obligations such as claims, the Markowitz portfolio theory provides the framework for achieving such objective. The essence of insurance business investment is to create a portfolio with assets which maturity will align with the expected return that can off-set claims from the policyholders as only guine claims can get paid by the insurance companies. The saving/premium that constitute investment ie intermediation decisions are based on the parameters of risk and returns and thus preference for more returns on investment rather than vise versa. The general problem of insurance business arise in collection of premiums as only after the pool of these premiums accumulated is then used in the settlement of claims by the insured and the investment returns serves as profit to the organization Omoke (2011). The Markowitz portfolio theory therefore provides the theoretical basis for this study because it explains why insurance business investment is concerned about the performance of their funds relative to GDP which is essentially a vehicle for economic growth.

Modern theory of financial intermediation
Based on Solow’s (1956) work, Merton (2004) noted that due to the absence of a financial system that can provide the means of transforming technical innovation into broad implementation, technological progress will not have significant and substantial impact on the economic growth and development. This is as a follow up to the theory developed by Merton and Bodie (1995) referred to as the modern theory of financial intermediation. This theory emphasizes six core functions of insurance to include: provision of means for clearing and settling payments to facilitate exchange of goods and services; provision of mechanism for pooling resources; resource allocation; risk management; provision of price information to help in coordinating decentralized decision making in various sectors of the economy and provision of means to tackle the problem of moral hazard, physical hazard and information asymmetry. Thus their theory of financial intermediation encapsulates both the traditional financial theory and the changes in the financial environment. Eze and Okoye (2013) believe that it is by realizing these functions that the insurance sector contributes to economic growth. They opine that the channels to growth model links the financial intermediation function of insurance companies to economic growth; as well-developed financial intermediation is capable of promoting economic growth through marginal productivity of capital, efficiency of channelling savings to investment, savings rate and technological innovations.

Empirical Review of the Study
Several empirical evidences in the literature have highlighted the importance of the insurance industry in stimulating growth and development of an economy (Ukpong & Acha, 2017; Sambo, 2016; Oyedokun & Adesina, 2015; Akinlo & Apanisile, 2014).

Ukpong and Acha (2017) examined the cointegration and causal relationship between insurance and economic development in Nigeria using time series data from 1990 – 2013. Gross domestic product (GDP) is adopted as a proxy for the level of economic development, while total life insurance premiums (TLP), total non-life insurance premiums (TNLP) and total insurance investment (TII) are used in measuring growth in the insurance sector. Data is operationalized through the stationarity test, cointegration test, regression analysis and granger causality tests. The stationarity test reveals that all-time series data are stationary at the 1%, 5% and 10% levels of significance. The test for cointegration shows that all cointegrate when GDP is the endogenous variable. The granger causality test reveals that there is a bidirectional relationship existing between GDP and total non-life insurance premiums while a unidirectional relationship exists between GDP and total life insurance premiums with no causal relationship existing between GDP and total insurance investments. An R-squared value of 0.9776 indicates that the independent variables account for 97.8% of the variations in GDP while the remaining 2.2% is attributable to influence of other variables or factors not in the scope of this study. We conclude that insurance not only contributes to economic development but also has a long term equilibrium relationship. Sambo (2016) empirically assess the effect of insurance investment on GDP in Nigeria. Globally, insurance investments have become center of attention in researchers and discussions among academics and analysts alike due to its importance not only to the individual companies but to the long run economic growth of the countries. As such, insurance investments have become an essential aspect of insurance literature. However, the
consequence of insurance investment by asset type to the total contribution to Nigerians GDP using monthly data from 1996 to 2012 has not been empirically established. The study employed monthly time series data for the portfolio of investment within this period and the GDP\(_t\) as its variables. Multiple regression model was utilized to estimate the relationship for the combine variables while linear regression for the total investment against GDP using Gretl- 1.9. 12 for the analysis. Consequently, the study concludes that the statistically positive R\(^2\) of 74% indicates a joint relationship between insurance investments and GDP in Nigeria.

Oyedotun and Adesina (2015) investigated the role of insurance sector in mitigating sudden and devastating occurrences thereby stimulating economic growth cannot be over emphasized, however, no consensus has emerged on the impact of insurance development on economic growth. Hence the need to inquire not only the growth of the insurance sector in Nigeria but also how the sector has impacted economic growth. Data were collected from secondary sources and it was regressed using ordinary least square at 95% significant level. It was discovered that there is relationship between insurance business and economic growth within the period of study. Akinlo and Apanisile (2014) examined the impact of the insurance industry on economic growth in sub-Saharan Africa countries over the period 1986-2011 using pooled OLS, fixed effect model and generalized method of moment panel model for estimation. The findings showed that the insurance market has positive and significant impact on economic growth (Akinlo & Apanisile, 2014). This implies that there is a positive relationship between premium and economic growth of sub-Saharan African countries.

3. METHODOLOGY

The study investigated the impact of insurance company on the growth of Nigerian economy between 1991-2017. Secondary source of data from the Central Bank of Nigeria (CBN) statistical bulletin (2017) was used in the study and the time series data covered the period of 29 years ranging from 1991 - 2017. The purpose of choosing this period is to empirically test the extent to which insurance company contributes to Nigerian economy. The method of data analysis adopted by this study is analytical. It involves the use of the ordinary least square regression analysis to determine the unit regression explain possible correlation between the dependent variable (Gross domestic product) and the independent variables, life insurance premium, non-life insurance premium and total investment. The researcher used the SPSS statistical package to analyzed the data. The package is suitable since the data spans across many years as in the present research (1991 – 2017).

Model Specification

The model is stated below as:

\[
\text{GDP} = f(\text{LINSP, NLISP, TINS})
\]

\[
\text{GDP} = \beta_0 + \beta_1 \text{LINSP} + \beta_2 \text{NLISP} + \beta_3 \text{TINS} + \mu
\]

\(\text{GDP}\) = Gross Domestic Product

\(\text{LINSP}\) = Life insurance premium

\(\text{NLISP}\) = Non-Life Insurance premium

\(\text{TINS}\) = Total insurance investment

\(\beta_0\) = Constant

\(\beta_1\) = Slope coefficient of LINSP

\(\beta_2\) = Slope coefficient of NLISP

\(\beta_3\) = Slope coefficient of TINS

\(\mu\) = Error term/Unbiased estimator
Data Presentation and Interpretation

Table 1: Result of Unit Root Test

<table>
<thead>
<tr>
<th>Series</th>
<th>ADF</th>
<th>Critical value</th>
<th>Order of Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINS</td>
<td>-3.226887*</td>
<td>-2.991878*</td>
<td>I(1)</td>
</tr>
<tr>
<td>NLIS</td>
<td>-4.808818*</td>
<td>-2.991878*</td>
<td>I(1)</td>
</tr>
<tr>
<td>TINS</td>
<td>-7.021669*</td>
<td>-2.991878*</td>
<td>I(1)</td>
</tr>
<tr>
<td>GDP</td>
<td>-3.651284*</td>
<td>-3.029970*</td>
<td>I(1)</td>
</tr>
</tbody>
</table>

**Note:** (*) indicates rejection of the null hypothesis of non-stationary at 5 percent significance level based on the MacKinnon critical values.

**Source:** Authors’ Computation from E-View, 2019

Unit Root Test

The study conducts unit root tests of the variables in the model to determine their time series properties or characteristics, that is, whether stationary on non-stationary. The conduct of unit root test is essential to avoid spurious regression results (Gujarati, 2004). Researchers have developed several procedures for the test of order of integration. The most popular ones are Augmented Dickey-Fuller (ADF) test and the Phillip-Perron (PP).

Augmented Dickey-Fuller test relies on rejecting a null hypothesis of unit root test (the variables are non-stationary) in favor of the alternative hypotheses of stationarity. The order of integration can also be ascertained with this test using the Augmented Dickey-Fuller (ADF) statistics. The result of unit root test is presented in Table 1 above while the tables for all unit root test conducted for the variables is presented in the appendix. The result in the Table above shows that all the variables are stationary. All the variables were stationary after the first difference. Therefore, it was concluded that all the variables were stationary and integrated of order one.

Table 2: Regression Analysis

Dependent Variable: GDP
Method: Least Squares

Sample: 1991 2017
Included observations: 27

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>161.3225</td>
<td>333.6325</td>
<td>0.483534</td>
<td>0.6335</td>
</tr>
<tr>
<td>LINS</td>
<td>8.980575</td>
<td>1.282610</td>
<td>7.001795</td>
<td>0.0000</td>
</tr>
<tr>
<td>NLIS</td>
<td>13.27721</td>
<td>4.663794</td>
<td>2.846870</td>
<td>0.0094</td>
</tr>
<tr>
<td>TINS</td>
<td>-42.15003</td>
<td>18.52990</td>
<td>-2.274703</td>
<td>0.0330</td>
</tr>
</tbody>
</table>

R-squared 0.762732 Mean dependent var 782.4535
Adjusted R-squared 0.730377 S.D. dependent var 650.2550
S.E. of regression 337.6463 Akaike info criterion 14.62251
Sum squared resid 2508111. Schwarz criterion 14.81607
Log likelihood -186.0927 Hannan-Quinn criter. 14.67825
F-statistic 23.57404 Durbin-Watson stat 1.573922
Prob(F-statistic) 0.000000

**Source:** E-View Output, (2019)
Interpretation of Regression Analysis

The model summary in the Table above shows $R^2$ value of 0.763. This indicates that about 76.3% variation in gross domestic product is explained by life insurance; non-life insurance and total insurance. The $R^2$ value which is 0.76 also shows the strength of the model, the closer to one the better the result, (Tabachnick and Fidell, 2007). The adjusted $R^2$ shows that after adjusting for the degree of freedom, the model could explain about 73% of the systematic variation in GDP. In addition, Durbin (1970), states that when the Durbin Watson statistic value is above 0.5 or 50 percent, independent observation is assumed. In other words, there is no auto correlation among the residuals of the study. The Durbin-Watson statistics (1.574) lies between 1.5 and 2.5. This is an evidence of no serial auto-correlation among error terms of variables considered for the study.

The overall performance of the model is quite good because the p-value is 0.000 which indicates that the model is significant. This signifies that the model is adequate in relation to Gross domestic product, life insurance; non-life insurance and total insurance; hence provides greater reliability for information contained in the Table 2 above.

Discussion of findings

The results of the regression analysis reveal that, there is positive relationship between life insurance, non-life insurance and gross domestic product of Nigeria, for the period under review (1991-2016). Life insurance has positive relationship with gross domestic product which indicates that 1 percent increase in life insurance will lead to ($9,000) increase in gross domestic product, also, 1 percent increase in non-life insurance will result to ($13,000) increase in gross domestic product and lastly 1 percent increase in total insurance will lead to ($42,000) decrease in gross domestic product. More importantly, statistics information in the Table 2 above discloses that life insurance, non-life insurance, have a positive significant impact on the gross domestic product while has a negative significant impact on the gross domestic product. This result conforms to the a priori expectation $\beta_1, \beta_2 > 0$ while $\beta_3 < 0$. The a priori expectation states that life insurance and non-life insurance which are represented with $\beta_1, \beta_2$ respectively will have positive impact gross domestic product while total insurance which is identified with $\beta_3$ will have negative relationship on gross domestic product.

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

From the analysis derived from the use of Statistical Package for Social Sciences and the interpreted result, it was concluded that there is a negative but significant relationship between Life insurance and Gross domestic product. Also, there is a positive and significant relationship between Non-life insurance and gross domestic product. And lastly, there is a positive but insignificant relationship between Total insurance and gross domestic product. Based on the findings, it was therefore concluded that insurance company has significant impact on the growth of the Nigeria economy.

5.2 Recommendations

Based on the findings, the following recommendations are apt out:

i) National Insurance Commission NAICOM Should monitor claims payment of the insurance companies so as to ensure transparency, avoid extortion and incorporate prudence which will in turn trigger the public confidence in the services rendered by the insurance companies and hence, promote economic growth.

ii) Secondly, since the result of the study reveals that insurance sector significantly correlate economic growth, the authority should create a complain annex where the insured can report all form of sharp practices, unethical dealings, and fowll play so as to further promote economic growth.

iii) Proper awareness and sensitization exercise should be embarking upon to enlighten the entire public on the significance of insurance policies on their day to day livelihood.

iv) That the policyholder should ensure that they also pay their premium regularly and as at when due insurance companies should perform their duties in a professional way to induce a prudent policyholder in making prompt premium payment.
v) The brokers should also advice to remit the premium collected from the policyholder promptly, to facilitate smooth claim settlement and increase economic growth.

vi) The premium should be reduced, so that it can be of benefit to majority of individual by insuring their property which will have a positive effect on the economy.

vii) There should be continuity of production after loss had occurred with a cheap means of handling risks to the insured in view of the fact that the principle of large number is brought to bear in the practice and operation of insurance.

References


1st National Conference of WITTED, Ilaro Chapter

ABSTRACT

This study examined the challenges of insecurity on food production in Yewa North Local Government Area of Ogun State. Specifically, the study focused on farmers-herdsmen’s violent clashes. Data for the study were obtained through focus group interview from the farmers’ and the herdsmen’s groups. Data were analyzed using content analytical technique. Through leaders of the two communities (Herdsmen’s and the farmers’), farmers and herdsmen directly or indirectly affected by the clashes were identified. Where impossible to communicate directly with the interviewees, interpreters were provided. Data obtained were categorized, main theme identified, compared, related information merged and reassessed in line with content analysis procedures. Findings showed that the clashes were fundamentally over common environmental resources including land, pasture, crop-residue, livestock routes and water points. The effect of the clashes were found to include death, serious injury, stoppage of schooling within a time period, psychological imbalance due to fear, reduction in food crops, deaths of cattle and general economic downturn. Efforts aimed at addressing the menace were mainly inhibited by ‘lingual-cultural’ barriers, egocentrism and short-term reactive actions by relevant authorities rather than long-term peace plan. It is recommended that intergroup dialogue and compensation being encouraged by the State government should be further promoted.

Keyword: Crisis, Food Production, Peace efforts, Threat

1. INTRODUCTION

Recurring violent conflicts between herdsmen and farmers is raising serious concerns in the country. As aftermaths of such conflicts, lives are usually lost, life-threatening injuries sustained, economic activities halted, women raped, children molested, crops and cattle destroyed among other threats to human security (Fasona and Omojowa, 2005). These conflicts are largely driven by competition for natural resources particularly landmass that serve as grazing roots to herdsmen and crop field to farmers (Nyong and Fiki, 2005; Osinde and Turner, 2007). Although, conflict in resource use is not uncommon and perhaps, not unnatural in human ecosystems, it however becomes not only unhealthy but also counterproductive when it degenerates to violent, destructive clashes (Adekunle and Adisa, 2010, 1).

Violent clashes among Fulani herdsmen and farmers are not new but appear to be occurring at unprecedented rate in recent times. In a newspaper study of crisis in Nigeria between 1991 and February 2005, Fasona and Omojola (2005) found that conflicts over agricultural land use between farmers and herdsmen accounted for 35 percent of all reported crises. In other words, in any three clashes reported in Nigeria, one is most likely to be between farmers and herdsmen. The aforesaid underscores the significance of the clashes to peace and security in Nigeria. Cotula, Toulmin and Hesse (2004) stated that the conflicts have not only heightened the level of insecurity, but have also demonstrated high potential to exacerbate the food crisis in Nigeria and other affected countries due to loss of farmer lives, animals, crops and valuable properties.

Apart from the dangers that the clashes portend for the realization of food security objectives, it also poses serious threats to hospitality business. Nowadays, perhaps due to high level improvement in communication...
made possible by the internet and particularly social media, news on violent clashes are more difficult to censor or go unreported. The clashes and their attendant carnage are often reported instantaneously scaring aware intending tourists and visitors to the country. Through this, potential foreign exchange opportunities are lost. Besides, the violent clashes have tendency to reduce agricultural production leading to high food prices. With high food prices, hospitality firms contend with higher production cost relative to what obtains in other climes putting them at disadvantage against global competitors.

Several reasons have been cited as causes of violent clashes in Nigeria. According to de Haan (2002), while farmers cite destruction of crops by cattle and other property by the pastoralists as the main direct causes for conflicts, burning of rangelands and Fadama and blockage of stock routes and water points by crop encroachment are major direct reasons cited by the herdsmen. Irrespective of differences in dimensions from which herdsmen and pastoralists view the causes of the clashes, they were fundamentally caused by competition for scarce natural resources particularly land, water and pasture (Adekunle and Adisa, 2010; Eme et al., 2014; Tyohmba, 2014).

Violent clashes between Fulani herdsmen and farmers, although reportedly more common in the middle-belt of Nigeria (Eme et al., 2014), the Southern States have now witnessing increasing occurrence of the scourge. Oyesola (2000) reported that the cattle herdsmen are moving towards south in search of pastures thereby increasing the possibility of violent clashes in this area. As a matter of fact, Ajuwon (2004) reported farmer-herdsmen conflict in Imo State, south east of Nigeria just as Olatunji (2012) reported in Punch newspaper violent clashes in border communities of Ogun State (South-west Nigeria) including Yewa North Local Government Area.

From the foregoing, it is obvious that urgent and enduring solution(s) is required to stem the tide of violent clashes in order to achieve much needed peace for progress in all sectors of the economy including hospitality. To proffer enduring solution to the crisis, empirical information on the remote causes, effect and the active players’ perceived solution(s) need to the unearthed. A review of literature on the subject matter, however, revealed that there was dearth of empirical information on the violent clashes in Yewa North Local Government Area of the State. This creates vacuum in knowledge. This study is conceived and conducted to fill the vacuum in knowledge by providing empirical information on challenges of insecurity on food production in Yewa North Local Government Area as of Ogun State.

This study specifically assessed the (i) remote causes of herdsmen-farmers/pastoralists clashes in the study area; (ii) the effect of such clashes on the affected communities; (iii) the responses to the conflicts by the affected people and (iv) suggested possible solutions to the crisis from the affected victims and the researcher’s points of view.

2. METHODOLOGY

2.1 The Study Area

The study is conducted in Yewa North Local Government Area (LGA) of Ogun State. The LGA is one of the 20 LGAs in Ogun State, Nigeria, known nationally as Egbado North Local Government Area. It covers a land mass area of 2043.60sq kilometre with a population of 183,844 (NPC, 2006). Yewa North Local Government Area is headquartered in Ayetoro. It has border communities bounded by the Republic of Benin. The inhabitants were mostly Yewa-Awori people but home to diverse people from various works of life and ethnic nationalities. The inhabitants of the Local Government Areas are predominantly farmers some of whom have had violent clashes with invading Fulani herdsmen.

2.2 Data Collection and Analysis

Data for the study were obtained through focus group interview from the farmers’ and the herdsmen’s groups. An interview guide made up of five questions bothering on farmer-herdsmen conflicts was used in gathering in-
depth data from the respondents adapted from Adekunle and Adisa (2010, 6). The questions were: “(1) what are the causes of farmer-herdsmen conflicts? (2) What are your personal conflict experiences? (3) How do you normally respond to the conflicts? (4) What are the factors hindering peace moves on the crisis? And what are the ways by which the conflicts can be managed?” It was pre-tested with five farmers and one herdsman to ensure that the procedure and terminologies were appropriate to the prospective respondents. This yielded no need for a change in the designed interview guide and procedure. Each of the four questions was followed by further probing (corollary) questions without compromising strict adherence to the objectives of the research. Through leaders of the Herdsmen’s and the farmers’ communities, farmers and herdsmen directly or indirectly affected by the clashes were identified. The interviews were conducted separately on separate dates to avoid confrontations. Where impossible to communicate directly with the interviewees, interpreters were provided. The interviews, conducted in two stages, lasted between 30 to 35 minutes per participant. The first stage was for the farmers, while the second featured the herdsmen. Each interview was audio-recorded, followed by verbatim text transcriptions that constituted material for data analysis. Obtained data were analyzed using content analytical technique. Data obtained were categorized, main theme identified, compared, related information merged and reassessed in line with content analysis procedures.

3. RESULTS AND DISCUSSION
This section presents the results and discussion of the study in line with the study objectives.
Causes of Farmer-Herdsmen Conflicts:
Evidence from the responses to the research questions, presented, by the two conflicting groups shows that the violent clashes in the study area were fundamentally due to competition for natural resources including land which serves as crop fields to farmers and grazing routes to the herdsmen. Water points, alleged destruction of pasture (that the herdsmen cattle would have fed on) and farmers’ crops were other causes of the violent clashes between the groups. Mutual suspicion of primordial “bad intent” and ulterior motives against each other appeared to fuel the crisis.

Table 1: The comparison between Fulani Herdsmen and Farmers views on the causes of the conflicts

<table>
<thead>
<tr>
<th>Questions bothering on causes on the conflict</th>
<th>Fulani Herdsmen</th>
<th>Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>What, in your own view, are the causes of the conflicts between herdsmen and farmers?</td>
<td>Farmers usually plant crop on well-known grazing roots on which cattle march and feed while grazing. This causes problem</td>
<td>The Fulani herdsmen are very stubborn, they match their cattle to farms to consume and eat our crops without compensation. This is the main cause of the conflict?</td>
</tr>
<tr>
<td>The cause of the conflict is fight over farmland and grazing routes. The farmers are very stubborn. All land belong to Allah but the farmers don’t want use to graze on the land</td>
<td>The Fulani herdsmen are intruders into our farm to destroy our crops. We have made complaints several times without solution from relevant authorities. Consequently we result to defending our farms which lead to clashes</td>
<td></td>
</tr>
<tr>
<td>Farmers don’t want our cattle to drink from the stream. They sometimes poison the stream so that our cattle will die. This causes fight between us and the farmers</td>
<td>The herdsmen have no regard for the indigenous farmers. They destroy farmlands and pollute the stream. When we confront them, the result to violence.</td>
<td></td>
</tr>
<tr>
<td>We fight because of our cattle and their crops. Farmers don’t want use to graze in the bush and claimed</td>
<td>We suspect that they are secretly planning to take over our land. Even without stopping them from grazing</td>
<td></td>
</tr>
</tbody>
</table>
they are indigenes. But everywhere belong to Nigeria and Nigerians on our farmland, they kill innocent people and molest our women. We can no longer accept this. As a result, we fight back.

5 We fight due to selfishness of the farmers. They want to use the farmland alone and don’t want our cattle to eat. They kill our cattle resulting in violence.

5 The Fulani herdsmen want to lord over us in our land. They destroy our crops, rape our women and you want us not to fight them? The fight will stop when they stop tramping on us.

Source: Field Survey, 2019, R = Respondent number

Effect of Farmer-Herdsmen Conflicts

The responses of the farmers and herdsmen on the causes of the clashes are presented in Table 2. It is evident in the table that the crisis resulted in loss of lives and economic resources. In the crisis, heinous crimes like killing and raping were committed. Both the farmers and the herdsmen sustained degree of losses but the indigenous farmers appeared to be worst hit. The herdsmen’s loss was generally economic while the farmers lose both economic resources and lives and sometimes dehumanized by rape. Summarily, the effect of the clashes include death, serious injury, stoppage of schooling within a time period, psychological imbalance due to fear, reduction in food crops, deaths of cattle and general economic downturn.

Table 2: The comparison between Fulani Herdsmen and Farmers views on the effect of the conflicts

<table>
<thead>
<tr>
<th>Question bothering on effect of the conflict</th>
<th>R</th>
<th>Fulani Herdsmen</th>
<th>R</th>
<th>Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are your personal conflict experiences?+</td>
<td>1</td>
<td>My cattle were killed by the farmers. I had 60 cattle before but they killed 33 out of them. I cannot forgive the farmers</td>
<td>1</td>
<td>I witness one of the clashes where the herdsmen came during the night and started killing people. For months, the community was deserted, children could not go to school for fear, women could not go to farm for fear of being raped. It was terrible my brother</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>The Yorubawa farmers are bad. They kill our cattle. The cattle that I have been raising for a long time were killed. They killed some of our members with ‘black magic’. I don’t have money to buy new cattle. They destroy my business</td>
<td>2</td>
<td>The clashes are very unfortunate especially to the indigenous people. I lost a brother that was very dear to me during one of the crisis. Houses were burnt, property destroyed leaving people with palpable fear of being attacked</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>One day, after our cattle grazed for about two hours. Some of the cattle became tired and could not move. Before we know what was happening, many cattle had died. We suspected that the grassland had been poisoned and lead to violent clash between us and the crop farmers.</td>
<td>3</td>
<td>The crisis has resulted in dwindling agricultural production in the area as farmers and their wards fear going to farm for fear of being attacked</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Our cattle were led to a stream to drink water. The indigenous farmer mobilized their youths to attack us at the stream. We retaliated and resulted</td>
<td>4</td>
<td>The crisis has made people to avoid coming to the area including potential tourists. I met a man on a trip who vowed never to come to the area in</td>
</tr>
</tbody>
</table>
in violent clashes for almost 1 month before it was settled. order not to be caught in crossfire

5 The clashes have ruined many herdsmen business and sometimes resulted in loss of lives.

5 On our way to farm one day, we started hearing screaming of people nearby. Before knowing what was happening, the herdsmen started pursuing us. We were saved by youths in the community who came on the nick of time. We could not go to farm for weeks because of fear of being attacked until the able-bodied men form vigilante group to protect us

Source: Field Survey, 2019, R = Respondent number

Table 3 presents the distribution of the respondents by their response to violent clashes between the conflicting groups. A critical look at Table 3 will show that while the herdsmen generally preferred to inform their leader when crisis is imminent, the farmers either inform the community chief or the NSCDC who calls in the police. These findings may imply that to resolve the lingering crisis in the community, leaders of the Fulani herdsmen could be an invaluable asset in taming seemingly aggressiveness of the herdsmen. Relevant authorities might want to consider suitable conflict management training programme for the leaders of the herdsmen and community chief in the crisis domain. The role of the Nigerian Security and Civil Defence Corps in managing the crisis is commendable but it appears too skewed towards managing the indigenous farmers. The NSCDC, having being trained, might be equipped to interact with the herdsmen also.

Table 3: The comparison between Fulani Herdsmen and Farmers views on how they responded to the crisis

<table>
<thead>
<tr>
<th>Question bothering on response to the crisis</th>
<th>R</th>
<th>Fulani Herdsmen</th>
<th>R</th>
<th>Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you respond to the crisis?</td>
<td>1</td>
<td>We notify our leader of the problem first and he tries to find solution to it. But when no solution was provided, we take to arms.</td>
<td>1</td>
<td>We notify the chief who immediately notify the police. Solutions are sought first but if there is no solution, we try to protect ourselves, loved ones and crops by every available means</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Our leaders are notified first after which we confront the farmers if they insist that we leave grazing area</td>
<td>2</td>
<td>We call the members of the NSCDC (i.e. Nigeria Security and Civil Defence Corps) who alerted the police to the crisis</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>We talk to our leader about the issue. When solution fails, we try to protect ourselves and our cattle</td>
<td>3</td>
<td>In the event that police could not contain them which is usually the case, we use ‘traditional’ means to protect ourselves</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Our leader is first contacted.</td>
<td>4</td>
<td>The only response is to protect ourselves and loved ones from the herdsmen by all available means</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>We make sure that we protect ourselves and our cattle at all cost</td>
<td>5</td>
<td>We report the matter to the NSCDC who usually inform the police but most times police complicate the issue instead of resolving it. We just leave everything to God</td>
</tr>
</tbody>
</table>
An assessment of the responses of the respondents revealed that both groups agreed that government reacts to the crisis rather than proffer long-term proactive solution to the crisis. Language and cultural differences were also stated as hindering understanding and amicable solution to the problem.

Table 4: The comparison between Fulani Herdsmen and Farmers views on factors hindering peace moves to end the crisis

<table>
<thead>
<tr>
<th>Question bothering on hindrances to peace moves</th>
<th>R</th>
<th>Fulani Herdsmen</th>
<th>R</th>
<th>Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you think the crisis can be resolved?</td>
<td>1</td>
<td>The farmers want us to leave and we cannot. Therefore, personal interest of the farmers and our own interest will not allow the crisis to be stopped</td>
<td>1</td>
<td>Government only reacts to the crisis when it happened. No long-term proactive measures are taken</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Government is not sincere in establishing grazing routes as recommended long time ago. This is the main reason why the problem persists</td>
<td>2</td>
<td>It can only be resolved if the herdsmen are mandated to have a range where their cattle will be reared</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>We don’t usually understand what they had to talk about when peace meeting is called. Although there are usually interpreters, they were not effective</td>
<td>3</td>
<td>There should be special law in place against destroying crops planted and when this occur, perpetrators should be brought to justice</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Government swing into action only when crisis occur.</td>
<td>4</td>
<td>The herdsmen have ego problem. When they are summoned to meeting, most times, they refuse to show up. They believe they own Nigeria and are superior to other tribes</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Moving from one location to another is our cultural way of rearing cattle. The farmers don’t want that and we cannot agree to staying in one place</td>
<td>5</td>
<td>The herdsmen should buy land like any other Nigerian and rear their cattle there. They should not trespass other people land and destroy their crops. That is the only way to resolve the issue</td>
</tr>
</tbody>
</table>

The distribution of the respondents by perceived solution to the crisis is presented in Table 5. Evidence on Table 5 reveals that while emphasis of the herdsmen were centered on equality in using land resources available in the communities, the farmers focused on respect for host communities and disarming the herdsmen as perceived solution to the crisis. A respondent from the farmers’ group, in addition, suggest improving on intergroup dialog as a means of ending the crisis.
Table 5: The comparison between Fulani Herdsmen and Farmers views on solutions to the crisis

<table>
<thead>
<tr>
<th>Question bothering on perceived solution to the crisis</th>
<th>R</th>
<th>Fulani Herdsmen</th>
<th>R</th>
<th>Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you think the crisis can be resolved?</td>
<td>1</td>
<td>Government should demarcate grazing routes that will be used only by herdsmen</td>
<td>1</td>
<td>Government should persuade or force the herdsmen to embrace modern cattle rearing practice in range rather than the archaic extensive system</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>The farmers should stop claiming that they own the land. Every land belongs to Allah and the Federal Government. They should stop claiming sole owner of the land. If they do that the problem will go</td>
<td>2</td>
<td>The herdsmen should be banned from carrying weapons. Why should only them be allowed to carry weapon. Why the special privilege?. That weapon gives them the effrontery to maim at slightest provocation</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>The farmer should be warned to stop killing our cows under the pretest that they destroy their crops. That is the only solution</td>
<td>3</td>
<td>The Fulani herdsmen should respect their hosts. They should not behave like they own our farmland. The type of grazing being practised by the herdsmen should be banned.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>There should be grazing routes designated for that purpose. That is the way to permanently resolve the issue</td>
<td>4</td>
<td>Carrying weapon by the herdsmen should be prohibited. It makes them prone to attacking farmers when protest is made about crop destruction by cattle. Crisis will only be solved if the killing tendency of the herdsmen is stopped</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Farmers should desist from claiming that they are the only one who have the right to use the land. Everybody should be. If this is adhered to, the crisis will be over.</td>
<td>5</td>
<td>Intergroup dialog should be encouraged to solve the crisis</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2019, R = Respondent number

4. CONCLUSIONS AND RECOMMENDATION

4.1 Conclusion

The study concludes that herdsmen-farmers’ crisis in the study area is serious deserving serious attention from relevant authorities. The cause of the crisis is fundamentally competition for use of land, grazing route/crop field as the case may be, and pasture. Death, serious injury, stoppage of schooling within a time period, psychological imbalance due to fear, reduction in food crops, deaths of cattle and general economic downturn. Efforts aimed at addressing the menace were mainly inhibited by ‘lingual-cultural’ barriers, egocentrism and short-term reactive actions by relevant authorities rather than long-term peace plan.

4.2 Recommendations

- It is recommended that intergroup dialogue and compensation being encouraged by the State government should be further promoted
• Government should look into establishing grazing routes for the herdsmen and convince them to embrace it
• NSCDC should try to interact also with the Fulani herdsmen
• Leaders of the two groups should be trained on crisis management technique as a proactive step in resolving the crisis

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COMPARATIVE IN-VITRO ANTISICKLING ACTIVITIES OF UNRIPE FRUIT AND LEAVES OF CARICA PAPAYA LINN

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ABSTRACT

Sickle cell sickness (SCD), otherwise called drepanocytosis is a genetic blood issue, described by a variation from the norm in the oxygen conveying hemoglobin molecule in red blood cells. Extracts of Carica papaya (Caricaceae) leaves and unripe fruits have been validated to have antisickling activities. This study analyzed the comparative in vitro antisickling properties of the extract and fractions of C. papaya leaves and unripe fruits. In-vitro antisickling studies were carried utilizing blood samples from sickle cell disease patients with normal saline and parahydroxybenzoic acid as negative and positive controls respectfully. Results confirmed the antisickling potency of both plant material used in this investigation. The extract and fractions reversed sickling in a dose-dependent manner. The unripe fruit was observed to be more potent having 2% (methanol), 3% (ethyl acetate), 4% (aqueous) percentage sickling in comparison with the leaf extract and fractions which has 3% (Methanol), 6% (Ethylacetate), 9% (aqueous) percentage sickling. Summarily, the unripe fruit of C. papaya has more antisickling activities when contrasted with the leaves. These outcomes demonstrate the possibility of C. papaya leaves and unripe fruits as an appealing potential possibility for the management of Sickle cell disease.

KEYWORDS: Antisickling, Carica papaya, Drepanocytosis, Haemoglobin, Parahydroxybenzoic acid.

1.0 INTRODUCTION

Sickle cell anemia is an acquired ceaseless blood malady emerging from a point alteration in the β-globin gene that prompts the substitution of glutamic acid by valine at the 6th position of the β-chain of hemoglobin. At low oxygen pressure, the mutant haemoglobin, assumes a sickle shape, polymerizes inside the red blood cell into a gel or further into strands prompting an extreme increment in the red blood cell impairment. Accordingly, smaller scale vascular impedance emerges which may prompt genuine, some of the time deadly crisis (Mehanna, 2001)

A medication that extend the delay time before polymerization may be of helpful incentive in SCD because a more extended time diminishes the likelihood of sickling of HbS haemoglobin. Detailed antisickling compounds in this group incorporate Niprisan, MX-1520 and 5HMF (Iyamu et al., 2003; Chaojie Zhang et al., 2004; Abdulmalik et al., 2005), which change intracellular sickle hemoglobin and repress sickling of haemoglobin. Endeavours to discover elective, less expensive and less harmful regimen for SCD treatment, prompted the disclosure of sickle cell reversal activities of Cajanus cajan seeds (Ekeke and Shode, 1985) and root of Fagara (Zanthoxylum macrophylla) utilized locally by conventional healers in Nigeria (Sofowora et al., 1975; Elekwa et al., 2005).

Carica papaya Linn. (Caricaceae) is a lasting, herbaceous plant, with bountiful smooth latex coming to 6–10 meters in stature, the stem up to 30 cm thick, basic or stretched over the center and roughened with leaf scars. The unripe fruit is utilized generally among the Yoruba clan of Nigeria for treating jaundice and for the administration of sickle cell iron deficiency (Elujoba, 2001). Scientists have revealed the antisickling capability of C. papaya leaf and fruit. In one of the analyses, it was expressed that after fermenting the dried unripe fruit for a few days, the day 5 concentrate was found to have the most astounding sickle cell reversal activities with 93% inhibitory and 84% antisickling activities (Oduola et al., 2006). Oduola et al. (2012) have announced “Caricapinoside” as the powerful antisickling compound present in the C. papaya unripe fruit. This antisickling compound was observed to be in the ethyl acetate fraction of the extract (Oduola et al, 2012). The crude methanol extract and ethyl acetate fraction of C. papaya dried leaves have been found to have astounding antisickling properties (Imaga et al., 2009; Imaga and Adepoju, 2010; Imaga et al., 2011). There is no report on the comparative antisickling activities of the leaves and the unripe fruit. The point of the exploration work is to compare the antisickling impacts of C. papaya unripe fruit and leaves.
2.0 MATERIALS AND METHODS

2.1 Plant material

The leaves and unripe fruit of *C. papaya* samples were collected from the premises of the Lagos University Teaching hospital, Lagos, Nigeria and validated by Mr. O.O Oyegoke of the Herbarium unit, Department of Botany, University of Lagos. Voucher specimens (No.T6789/2011) was prepared and stored in the herbarium.

2.2 Preparation of plant extracts

Dried leaves of *C. papaya* L. were ground in a cross beater mill equipped with a 1 mm sieve. The *C. papaya* leaves were extracted and partitioned into fractions as follows: 500g of the powdered sample was extracted with 1 litres of petroleum ether using a Soxhlet extractor for six hours. The marc was further extracted with 3 litres of aqueous methanol using the soxhlet extractor for another six hours. The obtained methanol extract was then evaporated to dryness using vacuum rotary evaporator.

Matured fresh unripe *C. papaya* fruit was peeled and the cream coloured seeds inside discarded, the unripe flesh of the fruit was chopped into little bits and rinsed with distilled water. The chopped unripe fruit was ground using a blender, to create a better surface area for extraction. 1kg of the grinded unripe fruit was extracted by maceration with 2 litres of methanol at room temperature for 6 days. On the sixth day the marc was separated and the resulting mixture was concentrated using the rotary evaporator.

2.3 Partitioning of the extracts

Extracts were partitioned with ethylacetate using a separating funnel. Separating funnel was left to stand for 15 minutes. A delineation was noticed between the two immiscible liquids. The upper layer (organic layer) was transferred into another clean beaker and continuous extraction was carried out on the lower layer (aqueous layer) by continuous addition of 25ml of ethyl acetate. This method was carried out on each 12g of crude extract measured.

All extracts and fractions were encoded as MEF- methanol fraction; EF- ethyl acetate fraction; AF- aqueous fraction remaining after the partitioning. All extract and fractions were concentrated using a rotary vacuum evaporator and stored at 4°C.

2.4 Antisickling activity

The HbSS blood acquired from patients were washed thrice in phosphate buffered saline to get the RBC which were then resuspended in ordinary saline and utilized for the examination as previously outlined by Acquaye *et al.* (1982), Ekeke *et al.* (1990) and Ogoda *et al.* (2002). The aqueous, methanol and ethyl acetate extracts of *C. papaya* leaves were utilized in this investigation, with para-hydroxybenzoic acid as the standard. 1 ml SS cell suspensions were pre-brooded with 5mg and 10 mg/ml concentrations of the extracts after the induction of sickling using 2% sodium metabisulphite. Microscopic investigation of the time course of the impact of varying concentrations of the extract and fractions on the sickling of SS erythrocytes was carried out. A plot of percentage sickling inhibition against time at 5mg/ml and 10mg/ml concentrations of the extract and fractions was analysed for a possible explanation of the observed antisickling effect.

3.0 RESULTS

Results acquired from in vitro investigations on the antisickling action of the Leaf and unripe fruit extracts carried out on SS blood samples, uncovered that treatment of SS cell suspensions with *C. papaya* leaf and unripe fruit extract and fractions repressed sickle cells formation under serious hypoxia at various rates and at 5mg/ml and 10mg/ml extract concentrations.
Fig. 1: *In vitro* antisickling activity: % sickling of 5 mg/ml concentrations of *C. papaya* methanol leaf extract.

At 5mg/ml concentration of methanolic extract (fig 1), result showed 8% sickling at 60mins compared with 10mg/ml (fig. 2) with 3% sickling at 60mins. The negative control, normal saline had 11% sickling, the positive control, parahydroxybenzoic acid with 19% sickling and sodium metabisulphite, which induces sickling, had 85% sickling. The 10mg/ml leaf methanolic extract in comparison with the 5mg/ml shows more potent antisickling activities.

Fig. 2: *In vitro* antisickling activity: % sickling of 10 mg/ml concentrations of *C. papaya* methanol leaf extract.

Fig. 3: *In vitro* antisickling activity: % sickling of 5 mg/ml concentrations of *C. papaya* leaf ethylacetate fraction.
At the concentration of 5mg/ml concentration, the ethyl acetate fraction revealed a percentage sickling of 6% and the percentage sickling at 10mg/ml concentration is 5%. The ethyl acetate 10mg/ml is, therefore, more potent than the 5mg/ml leaf extract concentration.

According to the graph results, concentration of 5mg/ml of aqueous leaf extract is more potent with 5% sickling compared with that of 10mg/ml with 9% sickling.
Fig. 7: In vitro antisickling of the 5mg/ml concentration C. papaya extract and fractions.

![Graph showing antisickling activity of 5mg/ml concentration C. papaya extract and fractions.]

Fig. 8: In vitro antisickling of the 10mg/ml concentration C. papaya extract and fractions.

The 10 mg/ml concentration of *C. papaya* leaf fractions were more effective in inhibiting sickling than the 5 mg/ml concentrations at longer incubation periods of 60 min as illustrated apart from the aqueous fraction which has the 5mg/ml fraction to be more potent. The methanolic (10mg/ml) fraction showed the highest antisickling activity followed by the ethyl acetate (5mg/ml) fraction followed by the ethyl acetate (10mg/ml) fraction then methanolic 5mg/ml) fraction then the aqueous (5mg/ml) fraction and the aqueous (10mg/ml) fraction.

![Graph showing antisickling activity of 10mg/ml concentration C. papaya extract and fractions.]

Fig. 9: *In vitro* antisickling activity: % sickling of 5mg/ml concentrations of *unripe papaya fruit* Methanol extract.

![Graph showing antisickling activity of *unripe papaya fruit* Methanol extract.]
In vitro studies reveal that at concentration of 10mg/ml (fig.10) the antisickling effect of the methanolic extract of \textit{C. papaya} unripe fruit had higher potency of 2% sickling at 60 minutes compared to that of 5mg/ml concentration (fig.9) which had 6% sickling at 60 minutes.

Comparing the sickling potential of \textit{C. papaya} unripe fruit at concentrations of 10mg/ml and 5mg/ml (fig.11 and 12) results show that at 10mg/ml the ethylacetate fraction possess higher antisickling potential of 3% sickling at 60 minutes compared to 5mg/ml which had 4% sickling at 60 minutes.
Fig. 13: *In vitro* antisickling activity: % sickling of 5mg/ml concentration of aqueous extract

Fig. 14: *In vitro* antisickling activity: % sickling of 5mg/ml concentration of aqueous extract

From the graph (fig.13 and 14), 10mg/ml concentration *C. papaya* unripe fruit aqueous fraction has higher antisickling efficacy of 3% sickling at 60 minutes compared to that at 5mg/ml which had 4% sickling.

Fig 15: Percentage sickling of 5mg/ml unripe fruit extract for all fractions.
Fig 16: Percentage sickling of 10mg/ml leaf extract for all fractions.

Figure 15 and figure 16 above reveal that the 10 mg/ml concentration of *C. papaya* unripe fruit fractions were more effective in inhibiting sickling than the 5 mg/ml concentrations at longer incubation periods of 60 minutes.

4.0 DISCUSSION

*C. papaya* dried leaves and unripe fruits have been shown in the management of drepanocytosis by indigenous people and logical research. Research has demonstrated the antisickling properties of the leaves and unripe fruit concentrates (Oduola et al., 2006; Imaga and Adepoju, 2010). In this investigation, *C. papaya* leaf extract was found to have a considerable strong antisickling action and extraordinarily influenced the time course for sickling in a dose-dependent way, the best dosages being 5 and 10 mg/ml concentrations of the extract and fractions. Antisickling compounds have been accounted for to lengthen the delay time of red blood cell polymerization as a component of the process for its antisickling activity (Iyamu et al., 2002). *C. papaya* leaf extract and fractions were not found to extend the delay time in this work yet unquestionably repressed sickle cell polymerization demonstrating that the extract may apply an objective strike on HbSS polymerization in enervating SS cell sickling. This could likewise demonstrate that the impact of the extract and fractions is presumably at the biomembrane level and not unwavering connection with sickle cell molecules dissimilar to other agents (Abdulmalik et al., 2005; Iyamu et al., 2003), whose antisickling activities are prefaced on the exchange with HbS molecules.

The discoveries in this investigation acclimate with the prior report of Oduola et al. (2006) which detailed that the antisickling factor in the extract of unripe pawpaw fruit is resident in the ethyl acetate part as this fraction averted sickling of HbSS red cells and switched sickled red cells in 2% sodium metabisulphite. Ogunyemi et al. (2008) revealed that the aqueous extract of *C. papaya* unripe fruit has a 93% inhibitory and 87% reversal antisickling activities which aren’t in concurrence with the report of this study. The inhibitory and reversal antisickling activities of the methanol extract of *C. papaya* unripe fruit gave 64% and 55% separately which is in concurrence with this report.

Thomas and Ajani (1987), suggested that the active compound(s) in the fermented *C. papaya* unripe fruit averting and reversing sickling could be organic acids delivered after the hydrolysis of the relating esters in the group. Imaga and Adepoju (2010), in an investigation, noticed that 10mg/ml concentration of the crude leaf methanol extract has a higher antisickling impact in examination with the 5mg/ml concentration. The ethyl acetate extract of this plant has the most noteworthy antisickling activity at 5mg/ml which doesn’t corroborate the result of this investigation that 10mg/ml of the ethyl acetate concentrate has higher antisickling action.

Parahydroxybenzoic acid and 3, 4-dihydroxybenzoic acid (Protocatechuic acid), 4-hydroxy-3-methoxybenzoic acid (vanillic acid) have been recently identified from Mulberry (*Morus alba*), *Lobelia sessilifolia*, which makes the sickle cell reversal activities of the unripe *C. papaya* extract obvious. These recently isolated and identified compounds frames the core of the confined compound (caricapinoside) (Oduola et al., 2012).

5.0 CONCLUSION

It can be deduced that the unripe fruit has more potent antisickling activities when compared with the leaf extracts. These indigenous extracts could be utilized in amalgamation with different nourishments in the handling and prophylactic control of sickle cell anaemia and other pathophysiological impediments of this and other related disorders.
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EVALUATION OF THE FEMALE ROLES IN NIGERIA MARKETING SALES JOBS

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ABSTRACT
This seminar paper will evaluate the role of women/females in the field sales/marketing jobs, identify their problems and setbacks, and proffer solutions that will enable organizations to have a second thought on the positive role women in the marketing/business environment. The term “Salesman” and “He” are not intended to be exclusive, but are used for simplicity’s sake, to avoid the reiteration of salesman or woman and he or she, each time a practitioner of the profession is mentioned, unless where it is necessary the gender differentiation is made, and the appropriate word ‘She’ or saleswoman is used, since the paper is on women/females. The paper relies much on literature review, oral interviews in the classroom over a period of ten years while lecturing at the Federal Polytechnic Ilaro and in responses to semester examination questions on the role of female sales representatives. This is in line with the theme women in management.

1. INTRODUCTION
The marketing/sales force was, and is still comprised mostly of only men/males, and little or no involvement of females/women. In the recent past, there have been changes in this system. A visit to different tertiary institutions in Nigeria (polytechnics and universities) where Business Administration and Marketing courses are being taught will reveal that a greater percentage of candidates being admitted are females/ladies, but still there in low involvement of females in sales jobs in Nigeria.

The importance of an efficient sales force in performing both the inside and field/outside selling/marketing functions of any organisation/manufacturing outfit cannot be over-emphasized. Sales force can consist of both males and females, provided they meet the necessary educational and professional qualifications required for the job, by the respective companies.

In Nigeria today, there has been increasing discrimination between a field salesman or a field saleswoman. So many reasons have been posed for this discrimination, ranging from physiological reasons, family engagements and responsibilities, societal customs, norms, values, and religious beliefs.

Ideally evaluating the role of Nigerian females in marketing should not be substantively different from that of their male counterparts, although emphasis and impact may vary from one establishment to another. In business, their role is unique and multi-dimensional that they permeate every economic activity, one way or the other to leave indelible marks on the nation’s path to economic growth, and the company survival and profitability.

1.1 Problems
However, in the Nigerian environment, women are tied down by various problems, some of which can be cultural, economic and psychological in natural. Ayozie (1999) enumerated them as follows

1.2 Questions
The question now is whether firms can employ more women for sales position? Has the old concern about the possible shortcoming of women been supported or disproved? Have sales manager attitudes changed as more women have been added to their sales force? Does the gender role of sex have anything to do with a person’s sales aptitude and ultimate performance? The result of a research although neither conclusive nor extensive shows that sex is largely irrelevant for explaining differences in performance across sales people.

There is no evidence of consistent differences in the productivity of women and men in industrial sales. The attitude of sales managers and industrial buyer towards women sales representatives has also become more positive over the years.
While both men and women are seen as sharing the potential for sales success, however, both group are perceive to have unique strengths and perform better on different aspect of the sales job.

2. **TRADITIONAL ROLE OF NIGERIAN WOMEN/FEMALES: YESTERDAY, TODAY AND TOMORROW**

Traditionally, Nigerian women/females and their counterparts in other parts of Africa, were mainly seen as home workers, nurturing the family and in some cases assisting their men folk on the farms, in fishing activities and even in trading.

Their role was mainly supportive in nature from early childhood, the, males was encouraged to be aggressive and assertive. Except in matrilineal societies (e.g. Ghana) the females traditionally were usually less assertive than the male. Even where she occupied leadership role in her community/village, her role was largely seen as supportive. She is supposed to be feminine and soft in approach to issues.

Early educational opportunities discriminated against the females as parents, especially fathers preferred to educate the male. In the PAST DECADE however, the women have broken down educational barriers, parents’ attitudes have since change and enormous opportunities have been taken up by the females to develop themselves mentally, to broaden their perspectives and where possible to develop their skill and expertise even in fields traditionally thought to be the exclusive preserves of the men folk. There abound now women directors, managing directors of banks, insurance companies and other financial institutions, women professors, pilots, sports people, footballers, commissioners, medical doctors, engineers, pharmacists, accountants and other skilled labour.

The Direct involvement of females in the MBA/Post graduate programme, considering its tight academic schedules, rigors and intensive classroom work, is enough testimony, that women places are no longer reserved in the KITCHEN. The Dictum now is “what a man can do, a woman can equally do it, and even do it better.”

Women’s role in business and nation building tends to broaden as the Nigeria economy develops. In other words, there is a strong positive correlation between the extent and nature of women participation in economic/business activities and the level of the country’s development. Other socio-cultural and demographic factors like societal norms, attitudes, age distribution of the labour force, level and rate of female education, religion(s), etc, also influence female participatory roles in the marketing activities.

Presently, Nigerian females have made substantial strides combining their home making role with their professional role to maximize societal return in many cases.

This topic is, it would be divided into four headings, with simple explanations of what selling and marketing is the problems that militate against female involvements in marketing jobs, types of selling jobs a female can perform and how these problems can be tackled.

2.1 **An Understanding of The Role Functions and Qualities of A Saleswoman Within The Marketing/Selling Environment In Nigeria**

Marketing encompasses many things and the people performing it, must posses some qualities which will enable them perform the numerous functions. It encompasses many more activities that most people think. It is a comprehensive term, involving selling, merchandise, promotion and distribution. It involves finding out what the consumers want, planning and developing a product or service that will satisfy those want and determining the best way to PRICE, PROMOTE and DISTRIBUTE that product or services. And this must be done at a profit.

It is also encompasses activities like environmental scanning, marketing, distribution pricing promotion planning and international marketing.

Aptly it is defined by the America Marketing Association (AMA) in Adeyanju (2008) and the Chartered Institute of Marketing (CIM) United Kingdom in Ayozie (2009) as thus:

“Marketing consists of the performance of business activates that directs the flow of goods and services from the producer to consumer or users” Ayozie (2014)
It is also:

“A management process responsible for identifying, anticipating, and satisfying customers requirements profitably” (CCM U.k) in Adeyanju (2008)

While selling is simply define as:

“The personal or impersonal process of persuading a prospective customer to buy a commodity or service or to act favorably upon an idea that has commercial significance to the seller.”

The selling concept as a management philosophy and orientation assumes that company products are not bought but sold. Those consumers tend to be induced to buy more of a product through sales stimulating devices. Selling starts with the firms existing products, and the task is to organize a strong sales oriented department, aggressively search out potential customers and selling the products to achieve profitable volume of sales. It focuses on field sales work, individual customers and sales transaction and it tries to convert company’s product(s) into cash.

Marketing on its own stresses on consumer need analysis and satisfaction and directs company resources towards making products and services that consumer want. It makes change in product design or quantity to match and adapt to changing consumer taste and characteristics.

The presentation of goods or salesmanship is a highly skilled art, but it is not one of those arts which are born in people. Proficiency in salesmanship, like most skills can be acquired by the industry, and by application of the individual. Anyone of average intelligence and ability can learn the skills which are necessary to become proficient, but as in all that professions above average intelligence ability will produce a far better saleswoman. The person who wishes to become an outstanding good saleswoman/marketer must be prepared to make sacrifices of leisure time and other interests, and he/she must be prepared to study and to work hard. Success in the field of selling depends upon the degree of favorably responses which the saleswoman gets from her customers. Progress in salesmanship develops from practice and the intelligent application of experience. Unlike scientists the saleswoman is making decisions based on her own judgment at every call on everyday. Each interview which a saleswoman conducts provides her with opportunities to exercise her skills and to develop her capacity.

At present, the salesman/woman has become increasingly important as the vital link between the manufacturer and the distributor and user. The selling process is an essential part of the marketing mix. A well-organized company will have made a thorough marketing research, evolved a product policy and taken decisions on advertising, pricing, packaging, distribution channels and the caliber and size of the sales force. Each of these is an important ingredient.

However, the final link in the marketing chain is that of the saleswomen who makes the personal presentation of her company’s goods or services.

There has been a growing awareness of the increasing importance of the saleswoman as the key link in the process of selling. More and more companies are spending bigger amounts on recruiting and training the saleswoman and they have been described as the vital link. The part she plays in the economy of the country is also vital. Even though, the economy may expand, unless the saleswoman ensures that her firm’s goods and services are well presented and persuasively sold to buyers, these goods will not reach the consumer.

2.2 Function

When examined in greater detail, the saleswomen’s function covers a wide range of activities which can dependent upon individual company policy, these includes the following:

1st National Conference of WITTED, Ilaro Chapter
- The presentation, demonstration and sale of his/her company’s goods, negotiation on quality, price and delivery. Explanation and presentation of company policy.
- The continuous examination of the market and reporting on shortages, oversupply and exchanges in trading conditions.
- The relaying to his company of any information of general commercial value
- The continuous acquisition of knowledge of her company’s products and their applications, selling points and the benefits to the user.
- Prospecting for new outlets and business and the extension of his/her company’s influence on her territory.
- The obtaining and maintenance of satisfactory displays for his company’s goods.
- The maintenance of good customer relations.
- Recommendation of credit for customers, assessment of their premises, organisation, standing and influence in the trade, and the acquisition of satisfactory trade references.
- The collection of outstanding accounts and avoidance of bad debts.
- The handling of complaints from distributors and users.
- Implementation of sales promotion schemes.
- The maintenance of satisfactory records of customers’ business with his company and the expeditious handling of correspondence.
- The proper cares and maintenance of any of the company’s property which has been entrusted to his charge.

2.3 The Qualifications and Personal Attributes Of A Saleswoman
In carrying out her functions, the saleswoman/female has tools and techniques, which can be developed and learnt. The tools are the saleswoman’s personality, her knowledge and judgment and the power of persuasion. The techniques are his/her preparation and planning, her approach to the buyer, the demonstration and presentation of her products, her method of negotiations and finally the method she uses to close the sales.

**Personality:** Very often it is said that “X” is a born sales man/woman because she has the right sort of personality, Gillam (1992)

Examined more critically, it is nearer to the truth to say that “X” is a likeable chap and people like to do things for her. To say that a person has to have the right sort of personality to be successful as a saleswoman needs only a moment’s examination to be disapproved. Anyone who knows only a few successful saleswomen will know that their personalities are completely different; in fact no two people (with the possible exception of identical twins) have the same personality. A particular kind of personality can guarantee success. Most successful saleswomen are very much aware of the personality characteristics and have consciously developed them. The personality characteristics which are most likely to help in building success as a salesman are:


A saleswoman needs knowledge of her own company, (i.e. history policies and methods of implementing them), the product or services (i.e. raw materials, quality standards, prices, delivery arrangements, current publicity programme, the competition, general trade information, Human relations (i.e. an understanding of herself, her strengths and weaknesses, ability to interpret mood and idiosyncrasies of buyers, an appreciation of her own personality, qualities and those of other people) and a knowledge about her territory.

**Power of Persuasion:** The prime object of the salesman’s vocation is to persuade people to buy. Buyers are constantly approached by salesman, many of them offering similar goods at similar prices, and it is the saleswoman with the greatest power of persuasion, who is likely to book the order. Persuasion is the art of convincing people that the offer of goods or services which is made meets their industrial or personal requirements satisfactorily. For persuasion to be successful, it is firstly essential to establish the true needs of the buyer and to be convinced oneself that the goods or services on offer will meet those needs satisfactorily.
The natural stability of women to project their and stabilize homes could be a substantial asset in seeing to a successful sales job. Other functions of the saleswomen long associated with women to varying but limited scale in their home running duties. The cliche is “behind a successful man is a woman”. The implication is that the sterling qualities of a woman as a more flexible and natural marketer of goods and services are being used in the background to promote domestic and home attainments. There is little wonder than that a few of the women folk when given the opportunity to play dominant roles on the forefront of marketing are almost never found wanting, they are always successful.

2.4 Problems of Female Involvement In Field Sales/Marketing Job
Seeking and working towards a sales/marketing career required TIME, COMMITMENT and HARDWORK. This is a difficult task for women because of the dual nature of their career. They are mothers, sisters and wives, raising children and managing the home front. The work of sales woman, especially field saleswoman involves much prospective and travelling, as well as getting involved in critical mental judgment. The greatest challenge for women therefore is how they can maintain a balance of their time between family and job in such a way as to avoid incompetency and in their professional sales job.

2.5 Types of Sales Jobs Performed By Saleswomen
There are tremendous numbers and varieties of selling positions, both in business and non-business organizations and each has certain duties and responsibilities and requires particular characteristics on the part of the sales person. Few of these kinds are

- Selling to retail stores
- Missionary selling
- Selling to ultimate consumer
- Van delivery selling
- Tangible sales
- Intangible/service selling
- Industrial goods selling
- Real estate selling

Selling to Retail Stores: Numerous saleswomen are involved in selling to retailers. The retailers are firms that purchase consumer goods and sell them to ultimate consumer. Representatives who sell to retailers usually are heavily involved in making regularly scheduled calls upon assigned customers in a territory. A great amount of time is spent in order taking, than order getting. Order taking consists of making routine calls on customers, checking their needs, taking their orders, and providing various non-selling activities. Order getting involves calling upon prospects who are not customers and converting them into customers.

Missionary Selling: They go on routine selling activities and help to build goodwill for the organisation, and interest in their product line. They are especially useful when the order taking representation carry a wide line and cannot devote sufficient attention to individual product or when they do not have the time or expertise needed to accomplish missionary task.

Industrial Selling: This Salesperson Handles Industrial Goods – Those Are Buyers Who Purchase Goods And Services In Order To satisfy the needs of their respective organizations, or to be used in the production of other goods and services which will be sold to ultimate users.

Selling to Ultimate Consumer: The saleswoman sells consumer goods and services to ultimate consumers. Various manufacturers employ saleswomen to reach the ultimate consumer, based upon the belief that employees of the manufacturer can do better selling job than the retails. This selling is usually common among companies producing perishable goods.

Real Estate Selling: A special types of selling is found in real estate industry. Those who occupy such positions are actively involved in order getting and in creatively attempting to solve problems of their prospective customers. Many salesperson in this field enjoy large incomes, although it usually requires period of apprenticeship and had work.

Occupationally, the odds against the women folk include pregnancy, maternity leave, confirming that chores are done in the house-hold, in addition to occupational responsibilities. However, careful planning and, having an understanding partners/spouse have made the triple role of mother-wife professional a pleasant reality for many women and a positive contribution to the economic growth of Nigeria.
3. METHODOLOGY
This paper relies much on literature review, academic interactions with male and female students while lecturing over a period of ten years, examination questions, analysis of personal observations, and personal interactions with female sales representatives who were my former students, over a period of time.

Cultural Constraints: The traditional Nigerian society expects a woman to play the second fiddle behind her husband irrespective of her personal qualifications and competence. Majority of women who achieve success in their sales jobs are usually spinsters, divorces and widows.

Those who achieve remarkable progress in spite of their marriage have been lucky to enjoy the supportive role of UNDERSTANDING husbands and partners. Another cultural prejudice against women is in the area of women education which have been accorded low priority and this has limited the areas of economic activities in which women could be gainfully employed. “as such, in 1980” three out of four women over 25 years of age in Africa were illiterates Orseter (1980). In 1985, there were only about 60 girls evolved in secondary schools per 100 boys in sub-Saharan Africa, the lowest in any region of the world except for southern Asia, with first about 40 girls per 100 boys. The level of illiteracy is twice as high in the rural area, as compared with the urban areas, Iyanda (1990)


“Statutory, the working age is 15-55 years, Statistics extracted from the Federal Office of Statistics (1978-1983) and from manpower study, National planning power Board brings out glaringly the following facts:
- That more men are educated and trained in Nigeria than women as indicated by 16 percent female literacy compared with 31 percent male literacy in 1980 out of total people on the statutory working age.
- That there is subsequently a much lower participation rate in the labour force by women then by men.
- That within the group of professionals (marketing included) women comprises only 3 out of every 30 professionals.

Psychological Constraints: Women find themselves preserving in a culture where traditional rules and implicit codes are devised by men, and oriented towards benefiting the men. The extent to which a woman “bull dozes” her way through the complex labyrinth of these men – made intricacies will determine her degree of career advancement, Shinn (1982)

The psychological constraint faced by women/female sales people can also come in the form of harassment (sexually by both her bosses and very rich customers) and name calling derogatively, describing her as masculine, hard and tough. This will make her feel insecure to endure and survive in activities and roles formally regarded as masculine monopolies. Remember a Nigerian women/female has her home to protect.

Furthermore, women are yet to build sufficient confidence about their innate competence and capability to perform and to sell as the males, and even better. Remember the cliché “what a man can do, a woman can equally do it, and even better”. This they need to do by escaping from a sense of passivity and difference. If the experiment with woman High court judge and law enforcement officers is anything to go by, then the laudable part women can play in the sphere of marketing activities is to be encouraged.

Stress
More recently, research has found those unmarried women, making a career in the male dominated field like sales, marketing, banking, engineering, etc. experience stress, as a hazard. Stress can result not only from long working hours, role overload, inadequate communications, and long hour of driving and traveling. Stress can have psychological effects on employees and can also affect their health and contribution to the effectiveness of the organisation, especially in the area of selling and marketing.

Iyanda (1992) on his paper women in management summed it as thus:

“women competing in a male dominated environment like most organizations are under constant stress and that professional women experience more stress than housewives”

Educational/Academic Restrictions/Barriers
Due to past limitations by Nigerians, Traditional forefathers which restricted women/females education, courses in the arts and the soft sciences (especially teaching) were just left for women/females to engage in. Few of them are really not prepared for the selling/marketing task, which is becoming a highly skilled art. The person who wishes to become outstandingly good saleswomen must be prepared to make sacrifices of leisure, time, and other interests. She must be prepared to study and work hard. For years now, the myth/notion is that if you are not qualified or trained for any specific job/profession. Then you can make in selling, most especially in rural Agricultural Selling. People say often that it required just common sense”, while you require common sense as an asset in selling, common sense is not enough to survive in the competitive world of marketing/selling. Now the marketing business requires greater skill for survival, which combines the creative aspects of arts, with the rigid requirements of science. There are now encouraging changes for the better as more and more females embrace the profession selling jobs, and make remarkable successes both in their theory and practice.

**Family ENGAGEMENT/RESPONSIBILITY**

The most problematic snag for women is the conflict between household responsibilities and their career in sales. There used to be a feeling of guilt by women over having a career while being a perfect wife and mother simultaneously. This is usually due to their inability to work out a realistic strategy; with clear definitions of and solution to emotional task and time commitment.

**Role**

All types of policies and change regarding the position of women in social production, and in the society are subject to the limits imposed on them by their respective reproductive role.

**Illiteracy And Ignorance**

Many girls of school age drop out of school because of parental un-negligence and unplanned pregnancies, and when this happens, the girls are hardly ever able to get back to school. This has affected the employment of females in field sales, marketing jobs in the long and short run

A thorough study of illiteracy found out that

> “Many illiterate parents do not feel seriously disturbed when children (girls) drop out of school so long as they receive domestic or commercial assistance from the girls when they are home.” Iyanda (1992)

**Purdah**

This is a situation where women in the Islamic religion do not come out of their confinement. This kind of condition is detrimental to the effective development of women in the society. A lot of Girls/females cannot work in commercial areas because of religious restrictions. Many wear viels when confines them to other matrimonial homes alone.

It is traditionally suggested by culture that men should make their education more serious than women.

That they should do something tangible with their lives, and that they expected to compete and advance.

According to IRENE and SYLVIA (1980) in their book “women in Management”,

> “It is expected that men are qualified them to govern the country, lead business and industry and fill professional role, and women are to stay at home to attend to households chores. Time and tide is changing that orientation in Nigeria”

**Demographical Factor**

At the stage of employing people for vacant positions, it has been found that employers generally prefer to employ the males then females. In circumstances where women are employed for sales job, usually preference is given to middle aged woman. One of the excuses given by the employers is that women are not as strong as men, they cannot stay outside for a longer period. They always ask for maternity leave and are frivolous in their approach to professional work. Research has proved it to be a fallacy.

**Religion**

The religious restriction is the area of greatest discrimination against women. Professional jobs some Christian denomination does not ordain women priests, bishops or pastors. Thus restriction extended to females at the point of employment and career advancement. Similarly in the Islamic religion, a woman is regarded as lesser
being than a man, and she cannot even enter the mosque to pray in the same enclosure as men. These religious limitations limit the career advancement of females in the selling jobs.

**Lack Of Confidence In Women, By MTN And Other Women**

Most women also believe that their purpose of working is to maintain the family, hence they are satisfied with such jobs as tailoring, petty trading, teaching and do not wish to advance professionally.

Men tend to be jealous, and this can develop into an inferiority complex. Hence they accuse their spouses having time intimate/illicit affairs with chief executives of a company to enable them to get certain juicy jobs.

Many woman undoubtedly lack confidence in what they do and the male folk perceive the selling job to be a world of marketing and management. A woman officer said that the major factor which has impeded her career the most was always a man is assumed to be able. The fear of not being competent enough, has brought about men not approving of woman in sales jobs and business jobs. For these reasons woman who feel that their family comes first, give up the career for the sake of peace in their homes and further children’s sake. This is affecting their interest and urge to aim higher or compete with the men on the same sales job.

Also in sales job, there is need for a lot of courage, endurance, perseverance. these factors are lacking by most woman. A good sales person must be aggressive. But most women are less assertive and aggressive; they have more empathy, than ego drive, thus these enable men to have edge over them in sales jobs.

The need for commitment is another thing in sales jobs. Most salespersons are not stationary. They are always on the move driving to prospect and sell to their customers. The rigors that are borne by the salespeople are very strenuous. For example, driving for almost 12 hours to their destination, meeting different types of new prospects. Some hostile and other aggressive, all these things frustrate woman away from sales jobs.

The need for proximity is an important factor. It means that the sales territory to be covered by a sales person might not be far from where the sales representative resides. Woman likes to stay within the area of their family residence to do their jobs than travelling to long distances to do their jobs. This hinders their involvement in sales jobs.

An important new dimension in Nigeria is that most prospects/customers tend to molest or sexually harass female’s sales representative who comes to them. Some even tend to be emotionally involved with them, despite the fact that the saleswoman is married person. This can be disgusting, and limits their interest and involvement in selling jobs.

**4. THE WAY FORWARD (SOLUTIONS AND SUGGESTIONS)**

Seeking and working towards a selling career requires time, commitment and hard work. This is a difficult task for woman because of the dual nature of their life. They most sell at home and at work. The greatest challenge for women here is how they maintain a balance of their time between family and their jobs, in such a way as to avoid stress and incompetence at work.

The growth of women as a proportion of the nation’s sales force is a significant positive sign. Equal job opportunity legislation will spark a steady growth. Equal opportunity should also be made mandatory for them in tertiary institutions to study marketing or business administration, so as to provide the necessary education needed to perform in the field sales job.

The proposed all female university, not minding its demerits, will increase the number of female enrollment in tertiary institutions.

Husbands, spouses and friends and boyfriend should be mentally educated on the task involved in sales job. The selling career is just like any other professional work. Longer hours at work and travelling are also obtainable in other jobs, not just selling. The woman on their own should justify the confidence of their spouse by not having what affairs outside their home. This will bring about the much desired confidence, and encouragement needed in career advancement.

The society, family, church, home, community should equally appreciate that women are traditionally created as natural salesperson. The qualities expected of a sales person are more possessed by women than men. Females
possess the qualities to painstakingly explain issues to people and to convince customer to take a course of action and that is what selling entails. Women increasing desire for financial independence can be gained through sales jobs.

From a resources allocation point of view, the increasing interest of females in sales positions is encouraging. Women have demonstrated their sales abilities. Ignoring this fact produces a waste of human resources that cannot be tolerated in the productivity conscious environment of today and in the future in Nigeria.

Government should go further to straighten the national commission for women and the ministry of women affairs. There has justified the government subsequent establishment of ministry of women affairs in 1995. All these and other incentives have given women the needed power and confidence to go into many professions of their choice.

5. CONCLUSION
In evaluating the role of women in salesmanship, it must be realized that marketing has been a service industry and the women folk are service oriented by nature to some extent. Education and training environments the female professional marketer has to adapt to a bewildering pace of structural re-organisations and will find herself ever in the front keen competition to win customers. By being self-disciplined herself, she will provide moral guidance to children, the men folk, and to upcoming female counterparts, to boast the process of nation building through the optimal use of human and materials resources.

The female should be adequately represented in private and government owned enterprises, to ensure that feminine interest is adequately represented, especially on matters affecting the homes and children. Private and government initiatives So far in this regards is appreciated, but should be encouraged to extend further. Rephrasing the popular Nigerian proverb “the words of our mothers are words of wisdom”. The sky is the limit for women who hope to achieve optimum success in selling job. They must work professionally, and exhibit strengths of character, accept feminity and its traditional objectives of marriage and motherhood on their terms and set themselves on ideal of relative independence and achievement.

REFERENCES


TECHNOLOGICAL IMPACT OF HYDROMAGNETIC MICROPOLAR FLUID FLOW OVER A STRETCHING PERMEABLE SHEET WITH THERMAL RADIATION AND JOULE HEATING EFFECTS

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ABSTRACT

This present study focuses on the technological impact of hydromagnetic micropolar fluid flow and heat transfer over an inclined sheet with the effects of thermal radiation, Joule heating and non-uniform heat source/sink as well as surface mass flux. The governing equations of the flow and heat transfer have been reduced from partial to ordinary differential equations via similarity transformation. Subsequently, shooting techniques alongside fourth order Runge-Kutta integration scheme are employed to solved the transmuted equations. The influences of the main controlling parameters are analyzed using graphs and tables with appropriate discussion. The results compared favourably with the earlier reported data in the literature in the limiting cases. The results also showed that the skin friction coefficient can be reduced better by applying the non-Newtonian micropolar fluid and that the velocity as well as the temperature profiles accelerate with a rise in the radiation parameter.

Keywords: Micropolar fluid; thermal radiation; Joule heating; non-uniform heat source/sink

1.0 INTRODUCTION

Fluids are broadly classified as Newtonian or non-Newtonian, depending on their flow characteristics. Newtonian fluids are fluids in which the viscous stresses arising from its flow at every point, are linearly proportional to the local strain rate (Łukaszewicz, 1999). These fluids obey Newton's law of viscosity. Examples are: water, kerosene, and alcohol. On the other hand, the non-Newtonian fluids are fluids which properties differ from those of Newtonian (classical) fluids, and thus fall outside the domain of the classical field theories. Most often, the viscosity of non-Newtonian fluids is dependent on shear rate or shear rate history. Examples of such fluids are ketchup, butter, cosmetics, polymer solutions, blood, colloids, mud flows, gels, biological fluids (mucus, semen, synovia fluid), cheese, etc.

In the recent times, the investigation of non-Newtonian fluids has been on the increase owing to its practical scientific, technological and industrial uses. Micropolar fluids belong to the class of non-Newtonian fluids due to its anti-symmetric stress tensor. The concept of micropolar fluids originated from Eringen (1966, 1972) as a sub-class of simple microfluid which was first introduced by Eringen (1964). Micropolar fluids consists of rigid, randomly oriented (or spherical) particles suspended in a viscous medium, where particles deformation is ignored. They are fluids with microstructure such that individual fluid particles may vary in shapes and rotate independently of the fluid rotation (Łukaszewicz, 1999).

Since introduction of the concept, it has become an active area of research for scientists and engineers because it offers a good mathematical model for examining the flow of complex and complicated fluids such as liquid crystals, polymeric fluids, suspension solution, fluids with certain additives, animal blood, fluids and clouds with dust (Chen et al., 2011; Mohamed and Abo-Dahab, 2009, Hayat et al., 2011). Various applications in engineering and technology include polymer engineering, drug suspension in pharmacology, sediments in rivers, biological fluid modelling, crude oil extraction, food processing manufacturing and so on (Ariman et al., 1973).
The study of hydromagnetic fluid flow and heat transfer over stretching sheet has become vital due to practical applications in industrial, technological and engineering operations. For instance, the extrusion of plastic sheet, metal extrusion, hot rolling, the extrusion of polymer sheet from a die, the cooling of metallic sheets, drawing of copper wires, glass blowing, textile and paper production, etc. It was Crane (1970) who pioneered such study. Also Gupta and Gupta (1977) extended the work of Crane to include heat transfer with suction or blowing. Several authors investigated such study (see Cortell, 2008; Kumar, 2009; Pal and Chatterjee, 2010; Mahmoud, 2011, Fatunmbi and Fenuga, 2018). In polymer extrusion for instance, during the fabrication processes, the material is made to enter into a cooling fluid after passing through a die, the quality of the final products depend, to some extent, on the kinematics of stretching and the rate of cooling during the fabrication processes. Thus, to obtain the quality desired, the rate of cooling can be controlled by the use of electrically conducting micropolar fluid.

Most transport phenomena both in nature and industries include flow of fluids driven by buoyancy forces due to variations in density as a result of temperature differences. Hence, the application of magnetic field in engineering operations play a crucial in areas such as in plasma studies, nuclear reactors, oil exploration, geothermal energy extractions, MHD generators, and boundary layer control in the field of aerodynamic. To this end, various researchers have investigated such studies. (see Sreenivasulu et al., 2018; Fatunmbi and Fenuga, 2018, Fatunmbi and Adeniyan, 2018, Kumar, 2009, etc).

In technology and engineering processes such as in the design of thrust bearing and radial diffusion and thermal oil recovery, etc. Suction/injection become important, for instance, injection can be applied in boundary layer control applications (e.g. film coating, polymer fiber coating and coating of wires), adding of reactants, prevention of corrosion, reducing drag whereas suction can be applied to remove reactants in chemical processes (see Mukhopadhyay, 2013; Hayat et al. 2010).

Many of the engineering and manufacturing operations occur at high temperature. For instance, in nuclear power plants, gas turbines, space technology and various propulsion devices for aircraft (Ibrahim, 2014). Thus, the influence of thermal radiation on magnetohydrodynamic flow and heat transfer plays a key role for the design of relevant equipment. The quality of the end product obtained during fabrication processes depends on how well the heat can be controlled, hence, the desired product can be optimally achieved with the intended characteristics when there is accurate knowledge of radiation heat transfer. In view of these immense applications, studies involving thermal radiation have been widely investigated. Hamad et al. (2012) applied implicit finite difference method to numerically study the influence of thermal radiation on heat and mass transfer of Newtonian fluid with variable fluid properties. Darbhashayanam and Mendu (2014) examined thermal radiation and chemical reaction effects on MHD free convection heat and mass transfer in a micropolar fluid using Keller-box method. (see also Olarewaju et al., 2011; Fatunmbi and Adeniyan, 2018).

In view of the above discussions and technological applications, this study is set out to investigate numerically the technological impact of hydromagnetic micropolar fluid over an inclined permeable surface under the influence of thermal radiation, Joulean heating with variable electrical conductivity and magnetic field. Similarity transformation variables have been applied for the reduction of the modelled nonlinear partial differential equations governing the flow and heat transfer into a system of nonlinear ordinary differential equations and then solved via shooting techniques cum fourth order Runge-Kutta integration scheme.

### 2.0 The Development of the Problem

The flow is assumed to be two-dimensional, steady and electrically conducting, viscous and incompressible micropolar fluid over an inclined permeable sheet with thermal boundary condition taken to prescribed variable surface heat flux given as \(-\kappa \frac{\partial T}{\partial y} = q_w = A \left( \frac{y}{L} \right)^n\), where \(A\) is a constant and \(n\) is power law temperature exponent parameter (see Figure 1). The flow direction is assumed to be in the \(x\) axis which is taken along the surface with \(y\) axis normal to it, the electrical conductivity varies with the fluid velocity in the direction of flow while the applied magnetic field varies in strength i.e. \(B = (0, B(x), 0)\). The radiative heat flux along \(x\) axis is assumed to be negligible as compared to that of \(y\) direction. The magnetic Reynolds number is assumed to be sufficiently small such that the induced magnetic field is negligible in comparison to the applied magnetic
field. Body forces such as Darcy, Forchheimer resistance are not considered in this study. Under the aforementioned assumptions as well as the Oberbeck-Boussinesq and the boundary layer approximations, the governing equations are given as.

\[ \frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0 \]  
\[ u \frac{\partial u}{\partial x} + v \frac{\partial u}{\partial y} = \left( \nu + \frac{\mu r}{\rho} \right) \frac{\partial^2 u}{\partial y^2} + \frac{\mu r \partial N}{\partial y} + g \beta_1 (T - T_w) \cos \varphi - \frac{\sigma_y (B(x))^2}{\rho} u, \]  
\[ \rho \frac{\partial T}{\partial x} + \nu \frac{\partial T}{\partial y} = \frac{\kappa}{\rho c_p} \left( 1 + \frac{16 \pi \rho \sigma^2}{k^2} \right) \frac{\partial^2 T}{\partial y^2} + \frac{1}{\rho c_p} (\mu + \mu_r) \frac{\partial^2 u}{\partial y^2} + \frac{\sigma_y (B(x))^2}{\rho} u^2 + \frac{\zeta'''}{\rho c_p} \]  

**Figure. 1: Flow configuration and coordinate system**

The boundary conditions are:

\[ y = 0: \quad u = 0, \quad v = V_w, \quad N = -\frac{\partial u}{\partial y}, \quad -\kappa \frac{\partial T}{\partial y}, \quad q_w = A \left( \frac{x}{L} \right)^n. \]  
\[ y \to \infty: \quad u = U_w = 0, \quad N = 0, \quad T \to T_w. \]

In Eqs. (1-4), the velocity component in the direction of \( x \) and \( y \) are respectively denoted by \( u \) and \( v \) while \( \nu \) is the coefficient of kinematic viscosity, \( T \) represents the fluid temperature whereas \( \beta_1 \) is the thermal expansion coefficient. \( V_w \) indicates the suction/injection, \( g \) is the acceleration due to gravity, \( \rho \) is the density, \( c_p \) the specific heat at constant pressure, \( \kappa \) is the thermal conductivity, \( N \) is the component of microrotation normal to \( x \) \( y \) plane and \( \varphi \) is the spin gradient viscosity, \( \phi \) stands for the inclination angle, \( \mu \) symbolizes the dynamic viscosity, \( \mu_r \) is the vortex viscosity. In Eq. (5), \( r \) is the microrotation boundary parameter having the interval \( 0 \leq r \leq 1 \). The case when \( r = 0 \) represents the vanishing of the spin on the boundary as reported by Jena and Mathur (1981). When \( r = 1/2 \), it depicts a weak concentration of micro-particles and the disappearance of antisymmetric part of the stress tensor (Ahmadi, 1976). However, \( r = 1 \) illustrates turbulent boundary layer flows as discussed by Peddieson (1972).
The electrical conductivity varies with the fluid velocity such as (see Helmy, 1995)
\[ \sigma_{\delta} = \sigma_{u} u, \quad (6) \]
while the applied magnetic field strength is a function of \( x \) such that
\[ B(x) = B_{0} x^{-\frac{1}{2}}, \quad (7) \]
The symbol \( q'''' \) in the energy equation (4) indicates the non-uniform heat source/sink and it is expressed as (see Rahman et al., 2009)
\[ q'''' = \frac{k}{2\nu x} \left[ Q(T - T_{m}) + Q^*(T_{w} - T_{m}) e^{-\eta} \right] \quad (8) \]
where \( Q \), \( Q^* \) respectively represent the coefficient of space and temperature dependent heat source/sink. When \( Q > 0 \) and \( Q^* > 0 \) then, a case of heat source is implied, however, the a case of heat sink is indicated when \( Q < 0 \) and \( Q^* < 0 \).

The governing Eqs. (2-5) are transmuted ordinary differential equations by using Eq. (9)
\[ \psi = (2\nu U_{0} x)\frac{1}{2} f (\eta), \quad \eta = \gamma \left( \frac{U_{0}}{2\nu x} \right)^{\frac{1}{2}}, \quad N = \left( \frac{U_{0}^{\frac{1}{2}}}{2\nu L} \right) g(\eta), \quad T = T_{w} + (T_{w} - T_{m}) \theta (\eta) \quad (9) \]

Substituting Eq. (9) into Eqs. (2-5) and taking cognizance of Eqs. (6-8) we obtained the following nonlinear coupled ordinary differential equations:
\[ (1 + K) f'''' + f f'' + K g' + Gr \theta \cos \psi - M f' = 0 \quad (10) \]
\[ \left( 1 + \frac{K}{2} \right) g'' + f g' + f' g - 2K (2g + f'') = 0 \quad (11) \]
\[ (1 + Rd) \theta'' + Pr (f \theta' - (2n + 1) f' \theta + Q \theta) + Pr Ec f''^2 + Pr Ec M f' + (Q \theta + Q^* e^{-\eta}) = 0. \quad (12) \]

The corresponding boundary conditions are:
\[ \eta = 0: \quad f' = 0, \quad f = f_{w}, \quad g = -r f'', \quad \theta = -1, \quad (13) \]
\[ \eta \rightarrow \infty: \quad f' = 0, \quad g = 0, \quad \theta = 0. \]

In Es. (10-13), the differentiation is done with respect to \( \eta \). \( K = \mu_{t} / \mu \) stands for the material (micropolar) parameter, \( M = \frac{2\sigma_{\delta} B_{0}^{2}}{\rho} \) indicates the magnetic field parameter, \( Rd = \frac{15 \tau^{2} \rho^{2} e^{2}}{k_{t}^{*} \kappa} \) is the radiation parameter and \( Gr = \frac{15 g B_{0}^{2} (T_{w} - T_{m})}{U_{0}^{2}} \) is the Grashof number while \( Pr = \frac{\mu_{t} c_{p}}{k} \) represents the Prandtl number. Also, the Eckert number is symbolized by \( Ec = \frac{\gamma^{2}}{\rho (T_{w} - T_{m})} \) whereas \( f_{w} = -V_{w} \left( \frac{x}{U_{0}} \right)^{\frac{1}{2}} \) denotes the suction/injection parameter with \( V_{w} = V_{w} x^{-\frac{1}{2}} \) being a constant, \( f_{w} > 0 \) suction, \( f_{w} < 0 \) injection and \( f_{w} = 0 \) means an impermeable sheet.
3.0 Results and Discussion

For the analysis of the results, we have made use of the following default values:

\[ K = 5.0, \, Rd = 0.3, \, Gr = 3.0, \, M = 1.0, n = 0.2, Q = Q^* = 0.2, \, Ec = 0.02, \, f_w = 0.5, \, \varphi = 30^\circ, \, Pr = 0.73. \]

The plots correspond to these values unless otherwise indicated on the graph. The nonlinear differential equations (10-12) together with the boundary conditions (13) constitutes a two point boundary value problem (BVP) which are solved using shooting iteration technique alongside Runge-Kutta integration scheme. The quantities of engineering interest such as the skin friction coefficient \( C_{fx} \) and the Nusselt number \( Nu_x \) (rate of heat transfer at the surface) are found out from the numerical computations. On setting \( f_w = Ec = n = Rd = 0 \), the case of Rahman et al. (2009), is recovered. Table 1 shows the values of the skin friction coefficient and Nusselt number as compared with Rahman et al. (2009) for variation in the inclination angle parameter \( \varphi \). The results are for the case of Rahman et al. (2009) when \( f_w = Ec = n = Rd = 0 \).

In the like manner, various values of magnetic parameter \( M \) for both Variable Electric Conductivity (VEC) and Constant Electric Conductivity (CEC) are found to be in good agreement as recorded in Tables 2. This confirms the correctness of the numerical code used in this work. Also, Tables 1 and 2, illustrate the reaction of Variable Electric Conductivity (VEC) and the Constant Electric Conductivity (CEC) on the skin friction coefficient \( C_{fx} \) and the Nusselt number \( Nu_x \) for various values of \( \varphi \) and \( M \).

Table 1: Comparison of values of \( C_{fx} \) and \( Nu_x \) with Rahman et al. (2009) for variation in \( \varphi \)

<table>
<thead>
<tr>
<th>( \varphi )</th>
<th>Rahman, et al. (2009)</th>
<th>Present Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( C_{fx} )</td>
<td>( C_{fx} )</td>
</tr>
<tr>
<td>0°</td>
<td>4.2424</td>
<td>4.2932</td>
</tr>
<tr>
<td>30°</td>
<td>3.9488</td>
<td>3.9859</td>
</tr>
<tr>
<td>45°</td>
<td>3.5731</td>
<td>3.5942</td>
</tr>
<tr>
<td>60°</td>
<td>3.0215</td>
<td>3.0233</td>
</tr>
</tbody>
</table>

It is clearly revealed that the skin friction coefficient as well as the rate of heat transfer reduces with an increase in \( \varphi \) as seen in Table 1 whereas the values of skin friction coefficient as well the heat transfer \( Nu_x \) are higher for the case of Constant Electric Conductivity (CEC) than that of Variable Electric Conductivity (VEC). An increase in \( M \) has a decreasing effect on the skin friction coefficient \( C_{fx} \) as well as on the rate of heat transfer at the surface for both cases of VEC and CEC.

Table 2: Comparison of values of \( C_{fx} \) and \( Nu_x \) with Rahman et al. (2009) for variation in \( M \)

<table>
<thead>
<tr>
<th>( M )</th>
<th>Rahman, et al., (2009)</th>
<th>Present Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( C_{fx} )</td>
<td>( C_{fx} )</td>
</tr>
<tr>
<td>0</td>
<td>4.2427</td>
<td>4.2427</td>
</tr>
<tr>
<td>0.2</td>
<td>4.1950</td>
<td>4.2079</td>
</tr>
<tr>
<td>0.5</td>
<td>4.1352</td>
<td>4.1606</td>
</tr>
<tr>
<td>0.8</td>
<td>4.0859</td>
<td>4.1185</td>
</tr>
<tr>
<td>1.0</td>
<td>4.0574</td>
<td>4.0927</td>
</tr>
<tr>
<td>1.5</td>
<td>3.9973</td>
<td>4.0353</td>
</tr>
<tr>
<td>2.0</td>
<td>3.9488</td>
<td>3.9859</td>
</tr>
</tbody>
</table>
The plots of velocity and temperature profiles against $\eta$ for various values of radiation parameter $Rd$ are shown in Figures 2 and 3. It is evident that both velocity and temperature appreciate with an increase in $Rd$. The increase in temperature enhances heat transfer across the boundary layer (Figure 3) which in turn causes the fluid motion to ruse as seen in Figure 2. The rate of radiative heat transfer to the fluid increases and then causing the temperature of the fluid to rise. Hence, to have the cooling process at a faster rate, the radiation parameter $Rd$ should be reduced.

Figures 4-5 exhibit the impact of the magnetic parameter $M$ on the velocity and temperature profiles respectively. It is noticed in Figures 4 that the velocity decreases with a rise in $M$ due to the imposition of the Lorentz force which acts against the fluid motion. On the other hand, the temperature profiles rise with an increase in $M$ Figure 5.
Figures 6-8 describe the effect of the micropolar parameter $K$ on the velocity, temperature and microrotation respectively. The velocity diminishes with a rise in the magnitude of $K$ as seen in Figure 6 whereas the temperature accelerates with a rise in $K$ as observed in Figure 7. The microrotation profiles rise near the sheet while further away from the sheet the profiles fall with a rise in $K$. The negative values denote the reverse rotation of the micro-particles.

The impact of the surface temperature parameter $n$ on the temperature profiles is displayed in Figure 9. It is observed that a rise the magnitude of $n$ reduces the thermal boundary layer thickness which in turn lowers the average temperature across the boundary layer.
The influence of the Grashof number $Gr$ on the velocity and temperature profiles are depicted in Figures 10 and 11. Evidently, the velocity profiles accelerate as the magnitude of $Gr$ rises as shown in Figure 10. Physically, $Gr$ indicates the relative effect of the thermal buoyancy force to the viscous hydrodynamic force in the boundary layer. Hence, a rise in $Gr$ enhances buoyancy forces which acts as a favourable pressure gradient accelerating the fluid within the boundary layer. Contrarily, the temperature profiles fall as the magnitude of $Gr$ increases as displayed in Figure 11.

Figure 12 illustrates the influence of both Grashof number and magnetic field parameter on the skin friction coefficient $C_{fx}$. An increase in $M$ produces a damping effect on the skin friction $C_{fx}$ coefficient whereas the skin friction coefficient rises with an increase in $Gr$ for a fixed value of $M$ as shown in Figure 12. Figure 13 is a plot of the skin friction coefficient $C_{fx}$ against the magnetic field parameter $M$ for various values of the micropolar parameter $K$ when the sheet is permeable ($f_w = 0.50$) and impermeable ($f_w = 0$). The shear stress at the surface $C_{fx}$ decreases with increase in both $M$ and $K$, however, the shear stress reduces better with permeable sheet than that of impermeable sheet as seen in Figure 13.
Figure 14 shows the impact of the angle of inclination $\phi$ on the skin friction coefficient. It is noticed that there is a reduction in the skin friction coefficient $C_{fx}$ with an increase in $\phi$ for fixed value of $M$. Hence $\phi$ tends to reduce $C_{fx}$. On the contrary, the graph of the shear stress at the surface $C_{fx}$ versus the magnetic field parameter $M$ for variation in the radiation parameter $Rd$ shows that an increase in the radiation parameter $Rd$ enhances the skin friction coefficient for any value of the magnetic field parameter $M$.

4.0 Conclusion

The analysis of thermal radiation effect on hydromagnetic flow and heat transfer of micropolar fluid with the influence of Joule heating, and variable electrical conductivity has been investigated in this study. The thermal boundary condition has been assumed to be variable heat flux while the heat source/sink is taken to be non-uniform. The set of governing equations has been transmuted from partial to ordinary differential equations and then solved numerically via shooting technique alongside fourth order Runge-Kutta integration scheme. The influences of the main controlling parameters have been analyzed with graphs.

Summarily, the following points are deduced from the study:

- The viscous drag at the surface can be reduced by using the non-Newtonian micropolar fluid as a working fluid during fabrication processes. This helps to reduce the friction better than the Newtonian fluids.
- The imposition of magnetic field parameter reduces the friction on the skin of the sheet, hence, magnetic field parameter can be used to reduce the viscous drag along the surface.
- The temperature distribution across the boundary layer diminishes with an increase in the surface temperature and thermal buoyancy parameters. However, the skin friction coefficient rises with thermal buoyancy parameter.
- The velocity and temperature of the micropolar fluid accelerate as the radiation parameter increases. Hence, to have cooling at a faster rate, the radiation should be minimized.

REFERENCES


ABSTRACT

The Next Level Agenda of this present government is a re-awakening call to all professionals especially engineers in partnering with the government in improving the slow economic development often attributed to its infrastructural deficit. Governments have been continuously blamed for thrusting the building of physical infrastructure on foreign expatriates through the politicians that do benefit from them. The economy of this country that has become moribund can be grown and sustained through cultural intelligence and indigenous nuances, which is possible if engineers can involve themselves also in policy formulations and implementations. This paper argues that the engineers’ involvement in policymaking is critical to the success of the Next Level Agenda of this present government as engineers have roles to play in the development of an economy that benefits and sustains all Nigeria. The full integration of engineering communities in policymaking at all levels is recommended and engineers to are to be involved in the making of the decisions that affect the profession.

Keywords: Engineers, Government, Infrastructure, Policy, Next Level Agenda

1.0 INTRODUCTION

Engineers in the role of a politician may not sound right as negotiation and compromise, the cornerstones of good politics, are against the core values of engineering. That notwithstanding the value of engineers taking an active and vocal role in government and policymaking is immensurable.

Many of the infrastructural challenges the government is facing require technical solutions and would benefit from technical inputs which can only be got from engineers as it does not make a sense to have people without technical background serve as the sole decision-makers on substantially infrastructures issues.

Since the country gained independence, successive governments whether military or democratic, have devoted efforts to infrastructure which are essentials to the social and economic well-being of the nation, unfortunately, it is obvious that the nation is still plagued with a lot of infrastructural challenges. This is why it is important that engineers be involved in government as the world is now technologically evermore globalized and engineers are in the best position to drive infrastructural growth as they have the experience and expertise to contribute significantly.

Infrastructure development sparks economic growth and improvements in quality of life but the extent to which Nigerian engineers are responding to the engineering challenges of achieving infrastructural development is now of national concern but Engineers not only have an obligation to public service but also a responsibility to their community and their local government. The fast growth of the economy in recent years has placed increasing stress on physical infrastructure such as electricity, railways, roads, ports, airports, irrigation, and urban and rural water supply and sanitation, all of which already suffer from a substantial deficit from the past in terms of capacities as well as efficiencies in the delivery of critical infrastructure services.
ENGINEERS, GOVERNMENT AND POLICIES

Engineers are seen by the public as practical technicians who avoid politics yet by avoiding the political process, engineers overlook the crucial interdependence that exists between engineering and government because political decisions are often viewed as irrational or ambiguous and are influenced by a variety of variables. (ASCE Government Relations Staff 2002).

The United States of America as an example had benefited from the foundational endeavors of people such as George Washington, the first president of the United States, who is generally regarded as the country's first engineer for promoting the field of Engineering. Herbert Hoover, the 31st and Jimmy Carter, the 39th presidents of America were engineers. Through them, many engineers have also served in other elected offices through the years bringing their technical expertise, rational thinking, and passion for making the world a better place to their political process.

It is worthy of note that infrastructural planning has been a consistent phenomenon in Nigerian administration since 1946. The Nigerian governments have aspired to achieve development through the use of various types of plans, namely short term (Annual Budget), medium and long term plans.

The Transformation Agenda is a blueprint or a general framework of the Jonathan Administration to achieve balanced growth and holistic national development of Nigeria. The Agenda, floated few months after the inauguration of the Jonathan Administration on May 29, 2011, was based on the Vision:2020, which itself was a derivative of the Millennium Development Goals, MDGs, was aimed at giving priority attention to all agreements, programmes and projects of the government in the next four years, 2011 through 2015, but one can only point to Mrs. Omobola Johnson Olubusola from Ondo who had a degree in Engineering in his cabinet. The absence of engineers in such administration was inimical to fully achieving the transformation agenda because engineers are the driving force in infrastructural development and no meaningful development can be seen without the inclusion of engineers.

President Muhammadu Buhari “Change Agenda” means a country that citizens get the basics that any country should provide: infrastructure that works, healthcare that is affordable, even free; respect for the environment and sustainable development, education that is competitive and outcome-oriented in a knowledge economy. Engineers participation is germane to achieving these especially the boosting of the economy. President Muhammadu Buhari had in his cabinet during the “Change Agenda” Dr. Ogbonnaya Onu, Engineer Suleiman Hussaini Adamu, Senator Hadi Abubakar Sirika, who had an aircraft engineering maintenance certificate.

The “Next Level Agenda” can be fully achieved if tagged the “engineers agenda” as engineers can no longer stand aloof leaving the stage to politicians and other professionals that have little or no technical know-how on how to drive infrastructural development.

THE ROLE OF INFRASTRUCTURE IN ECONOMIC DEVELOPMENT

Infrastructure is a broad concept that embraces public investment in physical assets and social services. Ogun (2010) argued that the urge to increase public investments in urban areas stems from the view that they are key determinants of long-term sustainable growth and the capacity of the poor to benefit from the growth process.

Infrastructure is an umbrella term for many activities usually referred to as "social overhead capital" by development economists. Precisely, infrastructure refers to a network of transport, communication, and public (social) services – all functioning as a system or as a set of interrelated and mutually beneficial services provided for the improvement of the general well-being of the population (Ogbuozobe, 1997). Public or social services refer to those services or facilities meant for the common goods of the people. They include water supply, health care delivery, education, postal and telecommunication facilities, electricity, etc. Sufficient infrastructural services are indispensable for economic development. The adequacy of infrastructure helps to determine a country's success or failure in diversifying production, coping with population growth, reducing poverty, improving environmental conditions, etc.
Indeed, socio-economic development can be facilitated and accelerated by the presence of infrastructure. If these facilities and services are not in place, the development will be very difficult and in fact, can be likened to a very scarce commodity that can only be secured at a very high price and cost. Adequate access to social welfare services, such as medical services, education, potable water supply, roads, electricity, employment opportunities, etc, are strong indices of development (Adeyemo, 1989). In any discourse on infrastructure, it is important to note that infrastructure can be broadly classified in two: physical (roads, electricity, telecommunication, etc) and social (education, health, recreation, housing, etc.). In some clime, physical infrastructure is often referred to as economic infrastructure.

Aigbokhan (1999) gives examples of physical infrastructure as public utilities such as power, telecommunications piped water supply, sanitation and sewage, solid waste collection and disposal and piped gas as well as public works which include roads, major dam and canal work for irrigation and drainage, and other transport projects like urban and interurban railways, urban transport, seaports and waterways, and airports.

Physical infrastructure has played a very significant positive role in the growth performance of countries in recent times. Where development of economic infrastructure has followed a rational, well-coordinated and harmonized path, growth and development have received a big boost. Within the context of Nigeria’s vision 20:2020 program, therefore, the realization of all that has been envisioned would depend to a large extent, on the availability of the necessary infrastructure in the right quantity and quality. This is so because infrastructure represents if not the engine, then, the “wheels” of economic activity.

ENGINEERING AND IMPLEMENTATION OF THE NEXT LEVEL AGENDA

For the “Next Level Agenda” to be fully achieved, the engineering profession has a pivotal role to play. The Nigerian engineers must apart from being equipped with the relevant skills to be part of the boom that will come with the economic transformation of the country; engineers must also learn to sell their professions to the political hierarchy. In the next four years, Nigeria will require to improve electricity, build millions of housing units, develop massive road and more rail transport systems, grow more food through mechanised agricultural systems, manufacture multifarious consumer goods locally, build and equip more hospitals and healthcare institutions, build and equip more schools and specialised intermediate and tertiary institutions etc.

Engineers participation in government or policymaking cannot be compared to other professionals as they felt no compelling reasons to be. Socio-economically, others have benefited from the time they spend in the political world, gaining relevant practice and connections. The divide between politics and the technical public highlights a root cause of why politicians dominate every sphere of politics, engineers need to rise up and bridged the divide if the “Next Level Agenda” of this present administration is to become a reality.

The President, Mohammedu Buhari, towards the end of his “Change Agenda” administration signed some bills such as Engineers (Registration, etc) Amendment Act, 2019 and the executive order 7 of 2019 which will inadvertently help the government in achieving its program. The time is now right and the stage set for engineers to take their positions in policymaking and governance as no significant infrastructural development can be made without their technical inputs.

CONCLUSION

That the Engineering profession has a critical role to play in the development of the nation is an irrefutable fact. There is a need for the government to realize the urgent need for involvement of engineers in policymaking in order to meet the infrastructure demand for the attainment of the next level agenda. Investing sufficiently in the development of local capacity that will support future requirements will lead to the development of a solid engineering base for the country. After all, engineering is at the heart of the development of a modern nation. Engineering is indeed development.
In achieving the next level agenda, the government in partnership with the engineering communities need to focus on the quality of manpower that graduates from our engineering schools as the engineering curriculum of the 20th century no longer sufficient to address the engineering challenges of the 21st century.

The Nigerian Society of Engineers must rise to these challenges and that of politicking and not see politics as a messy business because the nexus between infrastructure and next level agenda is the key to achieving global sustainability and the engineers are the essential resource that needs to become more proactive in achieving them and to play less insular role in policy-making.

REFERENCES


ACHIEVING CONTROLLED AND EFFICIENT STORAGE POWER REPLENISHING IN A SOLAR ENERGY SYSTEM

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ABSTRACT

In a solar energy system, the stored power is replenished via charging. It is important that the process be controlled, as overcharging can be destructive to the battery. To do this, a charge controller is required. It is an electronic device used to transfer the electrical energy available from a solar panel to the battery, allowing current to flow from the panel to the battery when it is not fully charged while disconnecting the battery from the solar panel when it reaches a preset threshold value, thus, maintaining the battery voltage at a level suitable to keep the battery in full charge state. Most charge controllers are imported. In this paper, a charge controller is developed locally for the purpose of controlling the charging activity of the battery in the solar energy system. It incorporates a PIC16F72 microcontroller, the system’s brain and also manager of its operation. The charge state of the battery is determined by converting the taken analog samples of the battery voltage into digital values. Current flow is allowed into the battery under charge from the solar panel, this leads to a steady increase in voltage across the battery until it reaches an upper threshold value set in the source code embedded in the microcontroller. A MOSFET was used as the switching device in the controller and the microcontroller displays the battery voltage on a liquid crystal display. The circuit was tested using simulation software and the results were excellent. A prototype was constructed using a bread board and tested, thereafter the circuit was transferred to a printed circuit board layout.

Keywords: Microcontroller, charging, solar, MOSFET and prototype.

1.0 INTRODUCTION

Solar energy is the free energy derived from the particles of light called photons, solar energy can be used for heating application, by concentrating rays light onto a spot via mirrors and/or energy harnessing as in photovoltaic cells, this cell then converts the harnessed energy, derived from the photons, to electricity by its semiconductor action (Gaur & Tiwari, 2013). This energy is enormous, its power reaching $1.2 \times 10^{17}$ W on the earth’s surface.

Photovoltaic systems, also called, solar systems is composed of one or more solar panels combined with an inverter and other electrical and mechanical hardware that uses energy from the sun to generate electricity (Taye & Gajjar, 2018), (Chu, 2011).

The Outputs of solar panels are usually within the range of 16 V to 20 V, so if there is no regulation the batteries will be damaged. The battery voltage rises and reaches the gassing voltage. If the battery charging is left unattended, the excessive gassing will lead to water loss and will cause the battery to be overcharged, this causes severe damage to the cells. Continuous exposure of the battery to this condition will make the battery to deteriorate and eventually unserviceable. The charge controller will maintain the battery at its highest state of charge and prevent overcharge. The heart of the solar energy system is the charge controller, it determines how much of the sun’s energy can be converted into electrical currents to charge the batteries (Noor, J. and Ayumi, 2009), (Mallika, Sivakumar, Engineering, & Engineering, 2017). Artificially powered chargers like converters, inverters, engine alternators have unlimited power backing them, either from electricity at a power plant or an engine. Charge controllers imported into Nigerian market includes (Mallika & Sivakumar, 2017), PWM (Pulse Width Modulation) charge controllers, MPPT (Maximum Power Point Tracking) charge controllers (Gupta &
Kumar, 2015), Shunt Charge Controllers and Series Charge Controllers (Marufa, 2012). This paper considers the development of a charge controller locally for the purpose of controlling the charging activity of the battery in the photovoltaic system. Hence, battery charging is regulated to elongate the lifespan of the power storage of the solar energy system and returns the maximum amount of energy to the battery at the shortest possible time.

2.0 Materials and Methods

This section is presented in two sections, namely; hardware and software. The hardware is the section that highlights the procedure of selection of the various electronic components, while the software section elucidates on the software development for the charge controller.

Hardware

The charge controller designed system model is as shown in Fig. 1. It is comprised of six stages.

![System model](Figure 1: System model)

**Power Supply Stage**

This is the stage of the system that provides $V_{DD}$ to the entire stages in the system, particularly, the microcontroller stage requires a 5 V dc supply. The input to this stage is obtained from the PV panel, a 12 V, it is regulated by an integrated circuit (IC), 7805. Capacitors are chosen to stabilize the 5 V output voltage. The designed circuit is as shown in Fig. 2.

![Power supply circuit](Figure 2: Power supply circuit)

**Drive and Switch Stage**

The maximum current chosen for this design is 20 A, therefore, the switching device to selected should be able to pass the required current and a little more during temporary surge. Based on these parameters the metal oxide semiconductor field effect transistor (MOSFET) serves as the best device for passing such a high current with
little or no power dissipated as heat. The IRF3205 was implemented since it can handle about 80A at 55V across the drain source.

To properly harness the perfect switching capability of the MOSFET a driver is necessary to convert the 5V logic level available at the output of the microcontroller to voltage level required to ensure full turn-on of the MOSFET, this is usually a minimum of 8V between the gate and source terminal. A totem pole driver was used consisting of adjacent pair of bipolar junction transistor. The circuit design is as shown in Figure 3.

**Figure 3: Driver circuit**

**Microcontroller Stage**

The controller stage in any system is important as it governs all the process of achieving the desired output. It is required that the system be intelligent or smart, hence, control must be through an embedded program. Such a control is called microcontroller. The choice of the microcontroller was based on the speed of operation of the target system, number of input and output to be sensed and controlled, the size of memory storage for program data and the cost of the controller. The microcontroller implemented is the PIC16F72A which contains 2K words, which translate to 2048 instructions, since each 14-bit program memory word is the same width as each device instruction. The data memory (RAM) contains 128 bytes. There are 22 I/O pins that are user configurable on a pin-to-pin basis, A/D converter, SPI and I2C. The charge controller requires I/O pin configured as analogue measurement input and two output ports (one to pulse the MOSFET and LED and the other to write status messages to the LCD screen).

The oscillator selection bits in this application were configured as high speed in the source code this allows for the connection of a 16 MHz crystal to the physical oscillator input. Watchdog Timer and Power up Timer were both disabled. The pin configuration implemented of the PIC16F72A microcontroller is shown in Fig. 4.
Recharging output Stage

Since the source of the microcontroller dc power is not at the same reference with the ground circuit of the microcontroller, it is required to translate the voltage level at the battery terminal to the microcontroller analogue input. The opto-isolator, 4N35 was introduced to achieve this. The opto-isolator system allows the use of an N type MOSFET, which is a perfect switching device choice. It transforms the value of the voltage across the battery into current flow into the input of the photo diode used to control the voltage across a resistor at the output of the microcontroller circuit. Thus, the voltage at the terminals of the battery is translated to the analogue input of the microcontroller. The circuit design of this stage is shown in Fig. 5.

LCD display stage

To display welcome messages and write the status of the Charge controller an LCD, 1620A was used. The microcontroller is configured to write display messages to the LCD using 4 bit mode so only the upper nibble in the data line is connected; the connection is as shown in Fig. 6.

The overall circuit design is as shown in Fig. 7.
Figure 7: Charge controller circuit design

Software

The flowchart for the development of the program is as shown in Fig. 8.
The source code for the controller was developed using C language and compiled using microchip XC8 C compiler.

Results and Discussion

The Proteus Design Suite is an Electronic Design Automation (EDA) tool including schematic capture, simulation and PCB Layout modules. The source code was written and compiled in the code work space. The simulation showed the voltages and currents on the various probes and also displayed the logic state of pins. The LCD module displayed the status of the battery under charge as shown in Fig. 9.
The charge controller was used to charge a 50AH battery using a 200W solar panel. The battery was completely discharged prior to the experiment the battery voltage as measured using a standard digital voltmeter was 11.80V. The charge controller was connected to the solar panel and to the battery, measurement of voltages and currents was done every thirty minutes.

Voltage result discussion

The voltage readings at every thirty (30) minutes interval was taken using a voltmeter and plotted as shown in Fig. 10.
The system is seen to charge the battery from 9am to 1pm. At 1 pm the battery was fully charged from 11.7 V at 9am to 13.82 V at 1pm. Above this time (1pm), the voltage did not increase any longer. The charge controller keeps the voltage and stops charging.

**Current result Analysis**

The current readings at every thirty (30) minutes interval was taken using an ammeter and plotted as shown in Fig. 11.

![Current Analysis](image)

Figure 11: Charge current plot

The charge controller starts the charging with a current of 0.71 A at 9am and reaches 2.04 A at 1.30pm. Having reached a charged stage, the charge controllers current starts reducing until it reaches 0.3 A. This reveals that when battery is fully charged, charge controller’s current output is reduced until it is put out completely.

**3.0 Conclusion and Recommendation**

The design of a pulse width modulated charge controller with MOSFET as switching device has been accomplished a program was developed from an algorithm and later converted to source code in c programming language. The design employed the use of an OPTO coupler to translate the battery voltage to the range necessary for measurement by the analogue to digital conversion circuitry. The prototype was built and successfully tested on breadboard before final assembly on the printed circuit board. The controller was able to modulate the battery voltage within a suitable level that prevented overcharging and water loss.

Charging current demand depends on battery capacity and size of solar panel, as these parameters increase there would be need for more current flow it is important to therefore increase the copper track width to reduce track resistance and voltage drops. Two or more MOSFET can be arranged in parallel to reduce conduction loss in the switching device.

The use of a high current schottky diode is important to reduce power loss in the reverse protection device.

**References**


ABSTRACT

This study examined the impact of electronic banking on satisfaction of corporate bank customers in Nigeria. The study adopted survey research designed through the use of structured questionnaire and the regression analysis was the statistical method adopted. The study found that there is a significant relationship between electronic banking and customers’ satisfaction. Also that E-banking has become popular because of its convenience and flexibility, and transaction related benefits like speed, efficiency and accessibility. Although these are fraught with insecurity and most importantly power challenges. The study concluded that e-banking has impact in improving customer satisfaction as it enhance reduction of time spent to withdraw cash and ensure control of account movement. The study recommends that banking sector should improve more security service for customer who uses electronic banking in order to enhance their confidence.

Keywords: Electronic, Banking, Consumer, Satisfaction.

1. INTRODUCTION

The recent consolidation exercise in Nigerian Banking industry has led to the emergence of e-banking in Nigeria (Ogunlowore and Oladele 2014). Technology is important in improving more efficient and faster services to customers. Emergence of e-banking was resulted also from globalization (Kadir & Poddar, 2015). In most developed countries, banking sector have developed the area of e-services and have actively involved in developing it in order to meet the ever changing needs and to satisfy the modern customers,(Hammoud, Bizri and Baba, 2018). The Electronic Payment Methods (EPM) are simplified and personalized ways of conducting financial transactions (using mobile or internet) without involving physical cash or paper cheque thereby reducing the instance where individuals have to carry large sums of cash and join lengthy queues on bank premises in order to conduct financial transaction (Jenevive & Anyanwaokoro, 2017). E-banking offers speed, efficiency, comfort and security compared to physical banking procedures. Automated Teller Machine (ATM) and Point of Sale (POS) have eliminated the need to use cheques and paper documentation (Jenevive & Anyanwaokoro, 2017).

Electronic payment strategies have been adapted in Nigeria and advancing by the increase in the share volume and worth of transactions accomplished through the ATM, POS, and Mobile phones, etc. For instance the volume of transactions executed with the ATM was put at N548.60 million in 2009 and this increased to N74.9 trillion in 2016 (Adegbesan, 2017). Thus, it is not doubtful concerning the penetration of electronic payment approaches in Nigeria (Jenevive & Anyanwaokoro, 2017). In Nigeria major cities and financial hubs, e-banking services are increasingly gaining ground as the customers received them as panacea to the problems of poor quality services peculiar to the Nation’s banking system. However, what is unknown is the level to which e-banking services have reduced the stress or problems associated with banking and enhanced customers’ satisfaction (Taiwo & Agwu, 2017). Emergent literature have identified that electronic banking in Nigeria is costly, occasioned by epileptic internet services, increase in the size of cash deposits, and increased exposure to fraudulent activities (Afolabi, 2009; Taiwo & Agwu, 2017).

Customer satisfaction as it refers to the extent to which customers are happy with the products and or services provided by a business. Further definition of customer satisfaction, it is a term generally used to measure a customer's perception of a company's products and or services(Farris, Bendle, Pfeifer, Reibstein 2010). According to (Offei and Nuamah-Gyambrah 2016), customers are now seeking for a faster and convenient technology with more rewarding banking experience. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are two factors mentioned in Davis’s Technology Acceptance Model (TAM) that influences users’ decision to use a particular technology system (Surendran, 2012). Therefore banks that fail to respond to the
emergence of electronic banking in the market are likely to lose their customers (Salehi and Alipour, 2010). It is not a straight forward science however, as customer satisfaction will vary from person to person, depending on a whole host of variables which may be both psychological and physical.

Electronic banking is critical in the transformation drive of banks in areas such as products and services and how they are delivered to customers. Thus, it is seen as a valuable and powerful tool in the development, growth, promotion of innovation and enhancing competitiveness of banks. Electronic banking is preferred by people because it aids easy transaction of money or funds between the buyers and seller, banks and customers etc. In Nigeria, for customers, banking today is no longer about safety of their funds and increase returns in their investments only. Customers demand efficient, fast and convenient services as well as banks that will offer them services that meet their particular needs.

2. LITERATURE REVIEW

2.1 Conceptual framework

The revolution of information technology has influenced almost every spheres of life; notable is the banking sector. The introduction of electronic banking has changed and redefined the ways banks were operating. Similarly, the emergence of global economy, e-business has increasingly become a necessary component of business strategy and a strong catalyst for economic development, as technology is now considered the major contributor for organisations’ success and as their core competencies. Consequently, electronic banking system has become an important practice among commercial banks in Nigeria, owing to the fact that the introduction of this banking system has improved banking efficiency in rendering services to customers. Thus, the banks (domestic or foreign) are investing more on providing the customers with the new technologies through e banking. Consequently, e-banking has become popular because of its convenience and flexibility, and also transaction related benefits like speed, efficiency, accessibility and so on (Elisha, 2010).

According to Abaenewe, Ogbulu, and Nduugu, (2013) electronic banking is the conduct of banking business electronically which involves the use of information communication technology to drive banking business for immediate and future goals. Electronic Banking System is seen to be an innovative service delivery mode that offers diversified financial services like cash withdrawal, funds transfer, cash deposits, payment of utility and credit card bills, cheque book requests, and other financial enquiries, (Onyedimekwu and Oruan, 2013). Similarly, Imiefoh (2012) sees electronic banking as an umbrella term for the process by which a customer may perform banking transactions electronically without visiting a brick-and-mortar institution. E banking generally implies a service that allows customers to use some form of computer to access account-specific information and possibly conduct transactions from a remote location like home or workplace, (Odulaja 2012).

2.2 Empirical review

During the recent years, the development of e-channels has dramatically changed the rules and operation in the banking industry. Today, several financial institutions are endeavoring to emphasize customer-oriented services. Hence building up competitive predominance almost depends on customers’ satisfaction with banking service. A study by Kumbhar(2011) on customer Satisfaction towards E-banking services of ICICI bank in India which considered factors affecting on customers’ satisfaction: an empirical investigation of ATMs service and examined that the cost effectiveness of ATM service were core service quality dimension and it was significantly affecting on overall customer satisfaction in ATM service provided by commercial banks.

Another study conducted in Unity Bank of Nigeria, has shown that an effective electronic banking system has improved its customer’s relationship and satisfaction Olorunsegun (2010).Wise and Ali(2009) argued that many banks have invested in ATMs to reduced branch cost since customers prefer to use them instead of entering the banking hall to transact business. The study of Aladawani (2001) revealed that there is a variation in the effect of electronic banking functionality factors on satisfaction and empirical evidence in this research suggest that electronic banking factors have a significant degree of influences on satisfaction. The study of Eddin, Al-Zubi (2011) concluded that electronic banking positively influences customer satisfaction in Jordan commercial banks. The study also finds that influence of electronic banking on customer satisfaction would differ according to the personal variable that is gender, age, marital status, educational level, computer literacy, and internet accessibility.

Kumbhar (2012) in his study has shown that there is a positive relationship between age, education and profession. The study result also showed that in order to increase customer satisfaction bankers should enhance service quality of alternative banking services. The study of Timothy (2012) in Nigerian context revealed that electronic banking service had significant influence on customers’ satisfaction in Nigeria.
3.0 METHODOLOGY

This study adopted survey research design through the use of questionnaire. The total population was unknown therefore, 100 questionnaire were administered to various users of electronic banking. The population of this study consists of the users of ATM and POS in Yewa Ogun State in which the sample size of 100 was drawn through the use of purposive sampling.

H0: There is no relationship between the e-banking proximity and the customers’ satisfaction.

3.1 Model Specification

The dependent variables for the purpose of this study is the customers’ satisfaction which include the geographical characteristics such as customer’ proximity, customers’ ability to control their accounts and availability of service at all time while the independent variable include the ATM, POS and the internet banking applications such as the use of token.

\[
Y = f(x1, x2, x3)..............................................................(1)
\]

\[
Y = \beta_0 + \beta_1x1 + \beta_2x2 + \beta_3x3 + \mu............................(2)
\]

Where x = independent variable i.e. e-banking

X1 = POS
X2 = Automated Teller Machine (ATM)
X3 = Token
Y1 = Customers satisfaction
\[ \beta_0 = \text{Intercept} \]
\[ \mu = \text{Error terms} \]

MODEL

\[
Y1 = \beta_0 + \beta_1ATM + \beta_2POS + \beta_3TOK..............................(3)
\]

4. DATA ANALYSIS AND DISCUSSION OF FINDINGS

Table 1: Result for the Relative contribution of the Variable(s)

<table>
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<tr>
<th>Variables</th>
<th>Parameter Estimate</th>
<th>Standard Error</th>
<th>T</th>
<th>Beta</th>
<th>P</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.082</td>
<td>0.507</td>
<td>0.161</td>
<td>-</td>
<td>0.873</td>
<td></td>
</tr>
<tr>
<td>EPA</td>
<td>0.180</td>
<td>0.051</td>
<td>3.523</td>
<td>0.408</td>
<td>0.001</td>
<td>Significant</td>
</tr>
</tbody>
</table>

Level of significant p≤0.05

Table 1 shows the adequacy of the model, the significant value is 0.001 with F value of 12.410 which shows that the model is adequate and that the test is significant. Hence the alternative hypothesis is accepted and we conclude that Automated Teller Machine (ATM) and Electronic Transfer Fund Point of Sale (EFTPOS) services have been able to satisfy customers

Table 2: ANOVA table for analysis of regression

<table>
<thead>
<tr>
<th></th>
<th>Sum of squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>45.130</td>
<td>24</td>
<td>1.880</td>
<td>2.570</td>
<td>.001</td>
</tr>
<tr>
<td>Residual</td>
<td>54.870</td>
<td>75</td>
<td>.732</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.000</td>
<td>99</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Level of significant p≤0.05

Table 2 is the coefficients table; it shows that impact of electronic banking system is significant with significant value of 0.001.
5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the result of the analysis it can be concluded that there is a positive relationship between demographic characteristics and customer satisfaction in e-banking than ordinary banking. E-banking has improved customer satisfaction than ordinary banking, enabled customers to control their account better than the ordinary banking, there is high opportunity in expanding the service and the banks have not taken any empirical study or customer survey to measure customer satisfaction in the technology. Customer’ knowledge about e-banking, availability of the service 24/7 and improvement of customers in controlling their account are more sensitive variable which determine customer satisfaction in e-banking. To put it in a nut shell, e-banking has impact in improving customer satisfaction, impact in reducing waiting time for customers to get bank service and impact in improving customers to control their account movements.

5.2 Recommendations

Official trainings should be organized by the banks for customers in order to increase customers’ awareness about e-banking rather than providing the card only. Banks should ensure that services on e-banking platform are improved on in order to maximize satisfaction and to be ahead of competitors. There should be effort to increase customers satisfaction above the current level and should conduct survey to measure customers’ satisfaction empirically. Future researchers should endeavour to determine customers’ satisfaction of e-banking in other geographic areas and as well consider other variables for e-banking.

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IMPACTS OF COMMUNICATION STRATEGIES FOR MOBILISATION OF WOMEN TOWARDS PARTICIPATION IN SCIENCE, TECHNOLOGY, ENGINEERING, MANAGEMENT AND MASS COMMUNICATION

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ABSTRACT

Today in our contemporary society, mass communications, engineering, science and technology play very significant roles in shaping our lives and determining some of the choices we make in our daily activities. Consequently, the roles of men and women have drastically revolutionized in today’s industrial society unlike what obtained in yesteryears. As such women now enjoy more priviledges, freedom, liberty and opportunities to showcase their intellectual capabilities and potentials in playing active roles towards the development of the means of communication, engineering, science and technology. But in spite of these developments, there still exist myriads of challenges and problems militating against the women folk in the society at large. It is in line with this anomaly that this study was undertaken to examine the impacts of communication strategies in the mobilization of more women towards active participation in science, technology, engineering, management and mass communication in Nigeria. The survey research method was adopted in carrying out the study while the questionnaire served as instrument of data collection. Purposive sampling technique was used to select 200 respondents for the study. Findings revealed that communication strategies have contributed immensely to creating awareness on the undisputable roles of women in science, technology, engineering, mass communication and management. The paper therefore, recommended that various means of communication including like the social media should be adequately utilised in encouraging more women especially the girl-child in accessing science and technologically-based education so as to ensure active participation of more women in taking up managerial roles in the near future. In addition, the government and stakeholders including women organisations like WITED, etc should create more enabling environment for women development, employment and empowerment which are catalysts to active participation in science and technology, engineering, management and mass communication.

Key Words: Women, Mobilization, Science, Technology, Engineering, Management, Mass Communications.

1. INTRODUCTION

Today in our contemporary society, there have come to be an increased awareness of the greater contributions which women now make in the areas of management, engineering science and technology in particular and in the industries and several organisations in general. This is therefore an essential precursor for creating a fair, equitable and inclusive society as well as attaining socio-economic growth and development. Yet a continued lack of gender equality in STEM disciplines demonstrates that the potentials of women are not being harnessed and utilised to their greatest effects. Creating more opportunities for women starts with creating a more inclusive, conducive and enabling environment where women would be allowed to meaningfully contribute their quota in nation building and socio economic transformation. Any specific efforts to recruit women into managerial roles in corporate settings are of no significance if organisations do not encourage a work place practice and enabling environment where women can strive without gender stereotypes and prejudices. Nonetheless, over the years women have become backbones and engine rooms for socio-economic growth and development. Achieving gender-diversity in enterprises is however of critical and fundamental importance to improving business and management outcomes. However, women have remained under represented in certain areas of businesses, management and engineering technology particularly at the senior management levels. A large percentage of women rarely attain executive management positions or serve as heads of boards of companies and parastatals due to favourotism, gender bias, stereotypes and gender inequality. But against all odds, women have increasingly gained grounds and risen to the same pedestal with men in terms of tertiary education attainment. Although much progress has been made but many eligible women remain under-utilised,
marginalized and sidelined despite representing a dynamic, able and capable pool of talents and potentials. A major barrier to women’s progress in science, engineering and technology worldwide continues to be the gender stereotyping of the managerial positions. However, women’s continued progress depends on recognizing the intractable nature of these negative attitudes and continually seeking ways to ensure that these attitudes do not derail or discourage ambitions, zeal, success, academic attainments and professional achievements. This paper therefore examined the impacts of communication strategies for mobilisation of women towards active participation in science, technology, engineering, management and mass communication (STEM).

1.1 Conceptual Overview

Communication Strategies
Communication according to Nayab (2015) involves the imparting or interchanging of thoughts, opinions or information among people by speech (oral), written (writing) or signs and symbols. Communication is a two-way process of reaching mutual understanding in which participants do not only exchange information, new ideas and feelings but also create and share meaningful messages. In general, communication is a means of connecting with people through messages. The different categories of communication include:

- **Verbal or spoken communication**: face to face, telephone, radio or television and other media.
- **Non-verbal communication**: body language, gestures, appearances, actions and inactions.
- **Written communication**: letters, e-mails, books, newspapers, magazines, internet or via other social media platforms like WhatsApp, Facebook, Instagram, etc.
- **Visualisation**: graphs and charts, maps, logos and other visual aids that can aid communication.

Similarly, a communication strategy is designed to help an organisation to communicate effectively and meet the core organisational goals and objectives. As a basis for monitoring progress, assessing results and developing new programs, strategic planning helps to ensure that internal communication function stays relevant and responsive to the needs of an organisation. Communication strategies can be verbal, non-verbal or visual. Verbal communication strategies can be broken down into two categories of written and oral communication. Non-verbal communication strategies consist of visual cues such as body language, facial expressions while visual communication strategies can be seen through signs and symbols, illustrations and web pages. Verbal communication entails the use of words in delivering the intended message. The two major forms of verbal communications according to Porges (2011) include written and oral communication. Written communication includes traditional pen and paper writing of letters and documents, e-mails, text, chats, SMS, and anything else conveyed through symbols such as language. This type of communication is indispensable for formal business communications and for issuing instructions. Communication forms that predominantly use written communication include handbooks, brochures, contracts, memos, press releases, formal business proposals, etc. The effectiveness of written communication depends on the writing style, grammar, vocabulary and clarity. Oral communication is the other form of verbal communication which involves the use of spoken words, either face to face or through phone calls, voice chat, video conferencing or any other medium. Various forms of informal communication such as the grapevine or informal rumour mills and formal communications such as lectures, workshops, conferences, group discussions, sensitisation campaigns, etc are forms of oral communication.

Oral communication finds use in discussions, formal and informal conversations. The effectiveness of oral conversations depends on the clarity of speech, voice modulation, pitch, volume, speed and even non-verbal communications such as body language and visual cues. Verbal communication makes the process of conveying thoughts easier and faster, and it remains the most successful form of communication. Non-verbal communication entails communicating by sending and receiving wireless messages. These messages usually reinforce verbal communication, but they can also convey thoughts and feelings on their own. Visual communication is a third type of communication through the use of visual aids such as signs, typography, drawings, graphic designs, illustrations, colour and other electronic resources. Visual communication with graphs and charts usually reinforces written communication altogether. And as the saying goes “a picture is worth more than a thousand words”, as such visual communication is more effective and impactful than verbal and non-verbal communication on many occasions.

1.2 Women in Science, Technology, Engineering, Management and Mass Communication (STEM)

A cursory look at the present situation over the world with minor exceptions shows that women play active social roles and demonstrate their abilities in a lot of professions like science, technology, engineering, management and mass communication. Nowadays, women are active in not only rendering administrative services but also in the production industry, natural resources management, educational hemisphere, and community development, information and communication technology. Women occupy different positions in these spheres and professions even though not at a very large proportion. In the developing countries of the
world according to a report by United Nations (2011), women are also often involved in the agricultural sector and food production, farming and marketing. In addition, most women in the developing countries of the world have additional responsibilities at the home front where they are saddled with enormous domestic chores and taking care of the members of the family. The National Assessments on Gender and STI report (2001) states that women still have low level and poor access to information, science, technology and engineering in comparison to men. Women’s roles in technological development is still poorly defined as women are grossly underrepresented. Technological resources are scantily used to support women’s activities and career. In addition, the percentage of women in science, engineering and technology is very low. Women have less access to different resources, which would help them to occupy leadership and managerial positions with active influence on the social processes. Women usually have lower access to finances, property, education and technology. This is very true and common in the developing countries but with a slight dimension in the developed climes. The reason for this can be attributed to so many factors. These challenges could be attributed to include gender pre-judgments, lack of many female role models, difficulties in bridging the gap between professional and personal responsibilities.

Gender pre-judgments assume common belief that women have less potentials and inclinations when it comes to science, technology, engineering and management. In addition, economic dependence on the men and political power also play contributory roles in female parity in STEM. Men occupy high positions in the society, control the political terrains and have access to the distribution of economic-power and resources. They influence the distribution of social roles as well and naturally, influence the status quo with male dominance in the different spheres of science, technology, engineering, management and mass communication. Gender inequality in STEM is more pronounced in the developing countries as women have less access to equal opportunities when compared to the men. It is however necessary that different approach should be adopted to resolve the imbalance because women also have what it takes to play very important roles in a lot of sectors in the contemporary society. They make great contributions to the development and improvement of human existence. While speaking on the place of women in STEM, Elechi-Amadi (2019) reiterated that women organisations like WITED is a body set aside by the Commonwealth Association of Polytechnics in Africa (CAPA) in 1988 to operate in African Polytechnics and Colleges of Technology with the mandate to identify and tackle the undesirable, exceeding low participation of female gender in science, engineering, technical and vocational education (SETV) at all levels. In Nigeria, the committee of Rectors of Polytechnics and Colleges of Technology in their efforts to ensure adequate participation and implementation formed and set up WITED National Coordinating Committee (NCC). The body was formerly inaugurated on 22nd October 1997 in Abuja by the then Head of State, late Gen. Sani Abacha. The foremost Chairperson of COHEADS WITED Committee in Nigeria was Chief (Mrs.) Felicia Abimbola Odugbesan of blessed memory, the then Rector, Yaba College of Technology Lagos, Engr. (Mrs.) Idiat A. Amusu served as her WITED National Coordinating with the National Secretariat domiciled in Yaba Tech, Lagos then. With WITED, being the full responsibility of the Rectors, every Rector of a Polytechnic and College of Technology in Nigeria appoints a female member of staff of the institution (preferably a teaching staff) to represent him/her in national WITED meetings and co-ordinate WITED activities for him/her because of their other numerous engagements and duties. Hence these representatives of the Rectors form the members of WITED NCC.

According to 2017 UNESCO report, more girls are in school today than ever before but they do not always have the same opportunities as boys to complete and benefit from an education of their choice. Too many girls and women are held back by biases, social norms, customs and traditions, marriage, childbirths and expectations influencing the quality of the education they receive and the subjects they study. They are particularly underrepresented in science, technology, engineering and mathematics (STEM) education and subsequently in STEM careers. In the UNESCO groundbreaking report, “Cracking the Code: Girls’ and Womens’ Education in STEM”, only 35% of STEM students in higher education globally are women and differences are observed within STEM discipline. For example, only 30% of female students in higher education choose Information and Communication Technology (ICT) Studies. This gender disparity is alarming, especially as STEM careers are often referred to as the jobs of the future, driving innovation, social wellbeing, inclusive growth and sustainable development. UNESCO is however giving special attention to this issue as part of its efforts to promote the empowerment of women and girls through education and as a response to the resolution and decision of its Member States on UNESCO’S role in encouraging girls and women to be leaders in STEM including arts, communication and design. There is no gainsaying the fact that empowering girls and women to enter STEM fields of study and careers and staying on course is imperative. And as Ministers of Education and other stakeholders pointed out during the UNESCO International Symposium and Policy Forum in Bangkok 2017, this requires holistic and integrated responses that can cut across various approaches which can engage girls and women in identifying these persistent challenges and professing solutions.
2. **LITERATURE REVIEW**

Communicating successfully means to pass on meaningful messages to the listeners/audience. In order to achieve a successful level of communication in various fields of human endeavours, certain devices are used to improve the various levels of communication, these devices are regarded as communication strategies. Although, there are many definitions of communication strategies in the literature genres but most of them are based on the concept of “problematicity”. Based on the foregoing, Oxford (1990) defined communication strategies as strategies that are used to overcome problems in communication messages due to limitations in knowledge or working-memory overload during real-time communication. Examples of such strategies include switching to the mother tongue, using memo or gestures and adjusting or approximating the messages.

However, Brown (1994) further expanded the definitions of communications strategies by including verbal and non-verbal mechanisms for solving the communication problems. This definition is very similar to Canale and Swain in (1980) who defined communication strategies as ‘verbal and non-verbal strategies that may be called into action to compensate for breakdowns in communication due to ability variables or to insufficient competence’. For Chong (2004) “the mechanisms used to repair and clarify an intended meaning are called communication strategies”. In a nutshell, communication strategy is a plan to achieve communication objectives. This may apply to internal communications and public relations. A communication strategy has four major components: communication goals, target audience, communication plans and communication channels.

- **Communication Goals** are the desired end-results of a program of communication. They are typically documented as the first step in developing a communication strategy. Communication goals are designed to be measurable but not time-bound as the schedule for achieving goals is found in the communication plan.

- **Target Audience**: a target audience is anyone you seek to communicate with as part of the strategy. For internal communication, this is usually the stakeholders of a project of function. For marketing communications, a target audience may include customers, media representatives and a target market.

- **Communication Plan** is an outline of how a communication strategy will be achieved including the schedule and responsibilities.

- **Communication Channels**: in communications, a channel is the means of passing information from a sender to a receiver. Channels of communication include oral means such as telephone calls and presentations and written modes such as reports, memos and emails.

### Graphical Representation of a Communication Strategy

<table>
<thead>
<tr>
<th>Type</th>
<th>Business Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>A Plan to achieve Communication Objectives</td>
</tr>
<tr>
<td>Related Concepts</td>
<td>Business Strategy</td>
</tr>
<tr>
<td></td>
<td>Public Relations</td>
</tr>
<tr>
<td></td>
<td>Channels of Communication</td>
</tr>
<tr>
<td></td>
<td>Internal Communication</td>
</tr>
<tr>
<td></td>
<td>Marketing Communication</td>
</tr>
<tr>
<td></td>
<td>Public Relations</td>
</tr>
<tr>
<td></td>
<td>Communication Goals</td>
</tr>
<tr>
<td></td>
<td>Measurable Goals</td>
</tr>
<tr>
<td></td>
<td>Expected Outcomes</td>
</tr>
</tbody>
</table>

**OBJECTIVES OF THE STUDY**

The main objective of this study was to examine the Impact of Communication Strategies in the Mobilisation of Women towards Active Participation in Science, Technology, Engineering, Management and Mass Communication. Other specific objectives of the study are as follows:

1. Finding out the level of awareness of the target groups to the existence of communication strategies?
2. Identification of the various types of communication strategies that can be adopted in the mobilisation of women for active participation in STEM disciplines and careers.
3. Ascertaining the level of accessibility and availability of the existing communication strategies to the target groups.
4. Examining the impact of the communication strategies in the mobilisation of the target groups towards the expected end results.
METHODOLOGY
The descriptive survey method was adopted for the study while the questionnaire served as the instrument for data collection. Purposive sampling technique was used to select two hundred (200) respondents for the study. Frequency distribution tables and simple percentage was used to analyse the data collected. The population of the study was two hundred members of staff randomly selected from the two campuses of the Federal Polytechnic Offa, Kwara State. In order to avoid loss of the data collection instrument, an on-the-spot method of distribution was adopted. Therefore, 200 copies of questionnaire were distributed and returned.

Data Presentation and Analysis

Table 1: Sex of Respondents

<table>
<thead>
<tr>
<th>Sex</th>
<th>No of Respondents</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>80</td>
<td>40%</td>
</tr>
<tr>
<td>Female</td>
<td>120</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field Work Survey 2019

Table 1 shows that 80 (40%) of the respondents adopted for the study were male while 120 (60%) of the respondents were female. This implies that more women were adopted in order to achieve some of the objectives of the study.

Table 2: Age of Respondents

<table>
<thead>
<tr>
<th>Age Group</th>
<th>No of Respondents</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 – 35</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>36 - 45</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>46 - 55</td>
<td>110</td>
<td>55</td>
</tr>
<tr>
<td>56 – above</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field Work Survey 2019

Table 2 shows that 110 (55%) of the respondents were within the age group of 46-55 years. 50 (25%) were in the age group of 36-45 years while the respondents between ages of 25-35 years and 56 and above formed 20 (10%) and 20 (10%) of the population of the study. The above analysis thus indicated that respondents within the age group of 46 – 55 years formed the majority of the study population.

Table 3: Academic Qualification of Respondents

<table>
<thead>
<tr>
<th>Academic Qualification</th>
<th>No of Respondents</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSCE</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>ND/NCE</td>
<td>25</td>
<td>12.5</td>
</tr>
<tr>
<td>HND/B.A/B.Sc</td>
<td>120</td>
<td>60</td>
</tr>
<tr>
<td>M.Sc/M.A.</td>
<td>25</td>
<td>12.5</td>
</tr>
<tr>
<td>Ph.D</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field Work Survey 2019

Table 3 indicates that a total of 20 (10%) of the respondents had only SSCE as their academic qualification. 25(12.5%) of the respondents had either an NCE or ND Certificate while 120 (60%) of the respondents possessed either a HND, B.A. or B.Sc. Furthermore, 25(12.5%) of the respondents had either an M.Sc or M.A with the remaining, 10(5%) had a doctoral degree in various disciplines.
Table 4: Level of Awareness of Respondents to the Existence of Communication Strategies

<table>
<thead>
<tr>
<th>S/N</th>
<th>Options</th>
<th>Yes</th>
<th>No</th>
<th>No Idea</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Awareness of verbal or spoken communication as types of communication strategy</td>
<td>160</td>
<td>30</td>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80%</td>
<td>15%</td>
<td>5%</td>
<td>100%</td>
</tr>
<tr>
<td>b</td>
<td>Awareness of non-verbal communication as types of communication strategy</td>
<td>70</td>
<td>90</td>
<td>40</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35%</td>
<td>45%</td>
<td>20%</td>
<td>100%</td>
</tr>
<tr>
<td>c</td>
<td>Awareness of written communication as types of communication strategies</td>
<td>180</td>
<td>20</td>
<td>Nil</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>90%</td>
<td>10%</td>
<td>-</td>
<td>100%</td>
</tr>
<tr>
<td>d</td>
<td>Awareness of visuals, graphs, charts, signs and symbols as types of communication strategies</td>
<td>140</td>
<td>40</td>
<td>20</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>70%</td>
<td>20%</td>
<td>10%</td>
<td>100%</td>
</tr>
<tr>
<td>e</td>
<td>Awareness of social media platforms like WhatsApp, Facebook, Instagram, Snapchat etc as types of communication strategies</td>
<td>170</td>
<td>20</td>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>85%</td>
<td>10%</td>
<td>5%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field Work Survey 2019

Table 4 shows the level of awareness of the respondents to the existence of different types of communication strategies. The data revealed that 160 (80%) of the respondents are aware of verbal or spoken communication as a type of communication strategy.

Table 5: Level of Identification of various forms of Communication Strategies by Respondents

<table>
<thead>
<tr>
<th>S/N</th>
<th>Options</th>
<th>Yes</th>
<th>No</th>
<th>No Idea</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Verbal or spoken communication includes face to face interaction, telephone conversation, radio and television communication</td>
<td>164</td>
<td>30</td>
<td>6</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>82%</td>
<td>15%</td>
<td>3%</td>
<td>100%</td>
</tr>
<tr>
<td>b</td>
<td>Non-verbal communication comprises of body language, gestures, actions and inactions</td>
<td>120</td>
<td>60</td>
<td>20</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60%</td>
<td>30%</td>
<td>10%</td>
<td>100%</td>
</tr>
<tr>
<td>c</td>
<td>Written communication are letters, e-mail books, magazines, internet via social media platforms</td>
<td>180</td>
<td>20</td>
<td>Nil</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>90%</td>
<td>10%</td>
<td>Nil</td>
<td>100%</td>
</tr>
<tr>
<td>d</td>
<td>Visualisations include graphs and charts, maps, logos and other visual aids that aid communication</td>
<td>145</td>
<td>35</td>
<td>20</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>75%</td>
<td>15%</td>
<td>10%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field Work Survey 2019

Table 5 reveals the level of the respondent’s ability to be able to identify the various forms of communication strategies. A total of 164 (82%) of the respondents were able to recognise all the form of verbal communication with 30(15%) having no level of identification and 6(3%) having no idea of what comprise of verbal communication. From all indication as contained in the table above, a large percentage of the respondents have the ability to identify and distinguish between all the various forms of communication strategies such as verbal communication, non-verbal communication, written communication and visualisation.

Table 6: Level of Availability and Accessibility of Communication Strategies to Respondents

<table>
<thead>
<tr>
<th>S/N</th>
<th>Options</th>
<th>Yes</th>
<th>No</th>
<th>No Idea</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Do you have access to all the various forms of communication strategies?</td>
<td>180</td>
<td>5</td>
<td>15</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>90%</td>
<td>2.5%</td>
<td>7.5%</td>
<td>100%</td>
</tr>
<tr>
<td>b</td>
<td>How often do you have access to the various forms communication strategies?</td>
<td>180</td>
<td>10</td>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>90%</td>
<td>5%</td>
<td>5%</td>
<td>100%</td>
</tr>
<tr>
<td>c</td>
<td>How often do you adopt the use of communication strategies to your daily activities?</td>
<td>190</td>
<td>10</td>
<td>Nil</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>95%</td>
<td>5%</td>
<td>Nil</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Field Work Survey 2019

Table 6 shows that 180(90%) of the respondents have regular access to all the various forms of communication strategies while 5(2.5%) do not have regular access to all the forms of communication strategies with the
remaining 5(2.5%) not having an idea of the availability and accessibility of the forms of communication strategies. In other words, there is a high level of availability and accessibility of the various forms of communication strategies to the respondents.

Table 7: Impacts of Communication Strategies on the Mobilisation of Target Group for Participation in STEM

<table>
<thead>
<tr>
<th>S/N</th>
<th>Options</th>
<th>Yes</th>
<th>No</th>
<th>No Idea</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Do you agree that the use of communication strategies can mobilize women for active participation in STEM?</td>
<td>166</td>
<td>24</td>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>83%</td>
<td>12%</td>
<td>5%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Options</td>
<td>Large Extent</td>
<td>Minimal Extent</td>
<td>Insignificant</td>
<td>Total</td>
</tr>
<tr>
<td>b</td>
<td>To what extent do you agree that communication strategies can be used to mobilize women for active participation?</td>
<td>170</td>
<td>25</td>
<td>5</td>
<td>200</td>
</tr>
</tbody>
</table>

|     |                                                          | 85%  | 12.5%| 2.5% | 100% |

Source: Field Work Survey 2019

From the data presented above in Table 7, a total number of 166 (83%) of the respondents agreed that the various means of communication strategies can be used to mobilize women into active participation in science, technology, engineering, management and mass communication. Meanwhile, 24(12%) of the respondents were of the opinion that communication strategies cannot mobilize women in STEM. 10(5%) of the study population had no idea on the impact of communication strategies and the mobilisation of women towards participation in STEM.

DISCUSSION OF FINDINGS

Based on the data collected and analysed on the study of the Impacts of Communication Strategies for Mobilisation of Women towards Participation in Science, Technology, Engineering, Management and Mass Communication, the following deductions can be made as guided by the objectives of the study. The existence of various forms of communication strategies comprising of verbal, non-verbal, written and visual communications have great impacts in mobilizing more women for greater participation in STEM. For instance, the rise of the social media has had significant effects on the strategic communication industry. Marketing communication use social media to enhance traditional effects such as direct mail, fliers, radio and television advertisements. Social media also enable users to create interactive contents for audiences. In the field of public relations, social media give professionals easier access to information and news media outlets. In many ways, the internet through the social media have made it easier for users and or consumers to hold organisations, public figures and large institutions accountable for their actions and inactions, Green (2012). Users can easily find, receive and share information about previous events involving the activities of various organisations, whether it was advantageous or damaging to the brand. Users can also provide instant public feedback by voicing their opinions via social media networks. Visual communication is also an effective way of passing information and messages that can help to encourage more women participation in STEM. This is because human minds process things in images. And visual communication is the art of passing messages and contents to a target audience, with the use of visual images instead of written texts. These visual images comprise of graphics, charts, maps, logos, bill boards, advertisements, posters, popular GIFs animations and signs among others.

SUMMARY OF FINDINGS

The study examined the impact of communication strategies in the mobilisation of women for participation in science, technology, engineering, management and mass communication. The survey research method was adopted for the study and the questionnaire was used as data collection instrument for two hundred (200) respondents who were randomly selected from among the staff of the Federal Polytechnic Offa, Kwara State. However the following are the summary of the findings of the study: The study revealed that communication strategies are of various forms comprising of verbal, non-verbal, written and visual communications. These forms of communication are used in different channels to disseminate and share information to the target audience. The study found out that communication is a vital aspect of human existence as it is a means through which feelings, emotions, messages and information can be passed on from a sender to a receiver.

Therefore, since communication strategies are embedded in communication, they can be used to pass information and disseminate messages on the mobilisation of women towards more active participation in science, technology, engineering, management and mass communication. The study also showed that women
participation in STEM have come to stay as women have influenced eras and contributed meaningfully to nation building. Throughout history, women have made extensive contributions in science, technology, engineering, management and mass communication but there is still room for improvement. Although in recent times, the number of women in STEM fields has grown exponentially over the past decades and keeps growing but there is still the existence of an overwhelming dominance by the male folks. This gender inequality, imbalance and under representation of women is often referred to as the STEM gap. And despite the growing emphasis on gender equality, the gender disparity in STEM fields and professions remains an issue in the modern labour market. The study finally reveals that communication strategies can be effectively adapted in spreading information, messages and contents that can enhance and promote active participation of more women who do not only possess the intellectual capabilities but have the potentials and the educational qualifications to occupy any top-notch managerial roles.

**CONCLUSION AND RECOMMENDATIONS**

When a piece of communication is straight to the point, relevant, worthwhile, interesting, meaningful, impactful and compelling, it moves the audience i.e. the listener or the reader to take an expected action. On the other hand, the means or channels through which communications take place are fundamental to the success or otherwise of the reception and interpretation of the messages and information. Herein comes the concept of communication strategies which are the various forms of verbal, non-verbal, written and visual communications that can be used to pass messages and information from a sender to a receiver. As channels of communication, there is no gainsaying the fact that they can be strategically adopted in the sending and receiving of messages and information on women in STEM. The place of communication strategies in information sharing through different platforms cannot be overemphasised. Therefore, based on the summary of the study carried out on the impacts of communications strategies in the mobilisation of women towards active participation in science, technology, engineering, management and mass communication, the following recommendations are hereby proffered:

- The society should take pro-active steps to support and generously fund women organizations and associations in several events so as to help integrate more local women into career progression and professional advancements.
- Stereotypes, gender bias and inequality threats are some of the compelling factors that explain for the under representation of women in STEM fields. These factors should be discouraged and removed in the professional settings and in the society at large.
- Women organisations and associations both within the academics, religious and social circles like NCWS, FIDA, CWO, FOMWAN, WITED, should create more awareness and sensitization campaigns on the intellectual capabilities, potentials and achievements of women in STEM fields.
- Government and stakeholders should strengthen the capacity of the society in delivering gender friendly and responsive STEM education, participation, achievement and continuation of girls and women in STEM careers and other professions to reduce the gender gap and inequality.

**References**


**Internet Sources**


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ADAPTABILITY AND GROWTH PERFORMANCE OF DIFFERENT STRAINS OF BROILER CHICKEN TO HIGH TEMPERATURE VARIATIONS IN NORTH CENTRAL NIGERIA

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ABSTRACT
The adaptability and growth performance of different strains of broilers were carried out to elucidate the suitability of the strains to the high-temperature region. 120-day-old chicks consisting of 30 Arbor Acre (T1), Marshal (T2), Anak (T3) and Cobb (T4) in each case were used for this study, and it lasted for six weeks. Data on the temperature, feed intake and growth performance were recorded. The highest temperature of 41.14°C was recorded in the sixth week, and 38.8°C was the least temperature which was observed in the second week. The study revealed that there was a significant difference in feed intake from the 1st week to the 5th week. In all treatments, there was a negative correlation to feed intake except for T4 (Cobb breed), which had a positive correlation. T4 (Cobb breed) was well adapted to temperature variations among other breeds having the highest weight gain of 1631.67 g and feed utilization with 2.70 as feed conversion ratio. Hence, from the study, it can be concluded that T4 can be reared during the dry season (January-March) with high-temperature variations of guinea savanna.

Keywords: Adaptability, Broiler chickens, Strains, Temperature

1.0 INTRODUCTION
Broilers chicken are homoeothermic animals that live comfortably only in a relatively narrow zone of thermo neutrality. Broilers are challenged with infections, feedstuff variation and climate changes, which may negatively impair the productivity of the commercial poultry industry (Shini et al., 2008). Changes in environmental temperature below or above the thermal comfort zone have a negative effect on broiler performance. It is well documented that growth, feed intake and physiological response are changed by environmental temperature. Report by Aengwanich and Simarak, (2004) reveals that the optimal temperature range for efficient production for broiler chicken over 4 weeks of age is between 18 - 21°C.

Meanwhile, there are evidences that animals and birds are being affected by global warming in both their distribution and behavior. Changes in atmospheric condition and animal production are always antagonistic to each other and its effect on livestock and poultry production cut across the globe (Menquesha, 2011). Phenotype is the result of the interaction between specific genotype and environment. Hence, genotype interaction with the environment is used to describe the situation where different genotypes (breeds) react differently to different environmental conditions (Okere, 2014).

Adesoji, et al (2010) stated that the greatest effect of weather is in Sub-Saharan Africa where livestock production takes about 40% of agricultural Gross Domestic Product (GDP) which engaged about 1.3 billion people, and supporting the livelihoods of billions of the world’s poor (FAO, 2007). Production of fast growing broiler chicken in molecular genetics results into modern species of broiler chicken which are easily affected by environmental stress which temperature contributes significantly to. (Deeb and Cahaner, 2002). Thus, it is important to know the extent of these effects.

1st National Conference of WITED, Ilaro Chapter
Many studies have been conducted to evaluate the effect of the thermal environment on birds’ growth performance (Leenstra, 1992; Yoon et al., 1995; Abu-Dieyeh, 2006), still more studies are necessary to examine the adaptability of different strains to high temperature. This research endeavour therefore focuses on adaptability and growth performance of different strains of broiler chicken to high temperature variations from January/February to March/April which marked dry season in the northern part of Nigeria (Saliu et al., 2013).

2.0 MATERIALS AND METHOD

Experimental Site
The study was conducted at the Poultry unit of Teaching and Research Farm of Animal Production Department, School of Agriculture and Agricultural Technology, Federal University of Technology, Gidan-Kwano, Minna, Niger State, Nigeria. Minna is characterized by two seasons which are the wet (April to October) and dry season (November to April). It has altitude of 75 m above the sea level with a land area of 6784 km² and lies between latitude 9°37’north and longitude 6°33’east. The mean annual rainfall is 1300 mm.. Temperature rarely falls below 22°C the peak being 40°C (February and March) and 35°C (November and December) Adama et al., (2007). It is located in the guinea savannah zone of Nigeria.

Source of the experimental birds
A total number of 120 day old broiler chicks of four different breed were used for the experiment (Anak, Marshal, Abor-acre and Cobbs). The birds were purchased from commercial hatchery outside Minna (Mark’s Farm Nigeria Limited).

Experimental design and management
Before the birds arrived, the house was washed thoroughly and disinfected. The litter material was spread on the floor to a depth of 4 cm (Asaniyan et al., 2007). The feeders and drinkers were set in place. Coal pot was used as source of heat. On the arrival of the chicks, multivitamins and glucose was administered in their water to serve as anti-stress and to stimulate feed consumption. The house was partitioned into 12 pens to accommodate the four treatments and each treatment was replicated thrice with ten birds each, T1 was abor acre breeds, T2 was Marshal Breed, T3 was Anak breed and T4 was Cobb breed. The birds were kept under an intensive system of management for the period of the experiment (6 weeks) and were given the same feed ration throughout the period of the experiment. Feed and water was given ad-libitum. The feed given was gotten from a commercial source (SONA feeds). The birds were brooded for four (4) weeks. Routine managements which include washing of Drinkers, Feeders, provision of clean water and feed, weighing of left over and checking of sick birds. Vaccination against major disease (IBD, NCD) and other medications were strictly adhered to. The birds were randomly and equally allotted into four treatments in a completely randomized design (CRD) experiment. Each treatment was maintained throughout the experiment.

Parameters measured
Feed intake
The feed intake was measured daily for birds in each replicate and quantity consumed per day was obtained by subtracting the quantity left over from the quantity fed. Weekly record of average feed consumption per bird was also obtained for each replicate by dividing the total quantity of feed consumed by the number of birds in each replicate.

Body weight gain
The initial body weight of the birds was measured using a weighing balance, the weekly body weight of the birds was also measured to obtain the average body weight gain per group. Final body weight – initial Body weight

Feed conversion ratio
This was calculated using the total body weight gain and feed consumed by the birds in their different treatments.

\[
\frac{\text{Total average feed intake}}{\text{Total body weight gain}}
\]

Weather Data
Weekly average Temperature parameter which covers the period of experiment (6 weeks) was collected at the Minna Meteorological Station, School of Agriculture and Agricultural Technology Teaching and Research Farm, Federal University of Technology, and used for the experiment.
Statistical Analysis
All data collected at the end of the experiment was subjected to analysis of variance (ANOVA) and General Linear Model (GLM) procedure of SAS. Duncan Multiple Range Test (2000), was used to separate the mean where there are statistical significant (p<0.05) differences.

4.0 RESULTS AND DISCUSSION

4.1 RESULTS

Average weekly temperature
Table 1 shows the average weekly values of temperature. Temperature was lowest at week 2 with a range of 24.21-38.80°C and highest at week 6 with a range of 27.14 - 41.14°C.

<table>
<thead>
<tr>
<th>Week</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27.02</td>
<td>39.71</td>
</tr>
<tr>
<td>2</td>
<td>24.21</td>
<td>38.80</td>
</tr>
<tr>
<td>3</td>
<td>26.35</td>
<td>39.85</td>
</tr>
<tr>
<td>4</td>
<td>25.00</td>
<td>41.00</td>
</tr>
<tr>
<td>5</td>
<td>26.28</td>
<td>40.14</td>
</tr>
<tr>
<td>6</td>
<td>27.14</td>
<td>41.14</td>
</tr>
</tbody>
</table>

Source: Federal University of Technology, Minna. Metrological station

Feed intake, Weight gain and Feed conversion ratio of the treatments
Table 2 shows the mean feed intake, weight gain and feed conversion ratio. Significant difference was observed for weight gain with T4 recording the highest weight gain at 1631.6 g and the lowest body weight was recorded for T1 at 1238.9 g. The lowest significant feed conversion ratio was observed at T4 (2.7) and T1 (3.61) recording the highest. Meanwhile, no significant difference was observed on feed intake in all the treatments.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>SEM</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed intake (g)</td>
<td>4492.2</td>
<td>4436.0</td>
<td>4714.3</td>
<td>4509.8</td>
<td>47.89</td>
<td></td>
</tr>
<tr>
<td>Weight gain (g)</td>
<td>1238.9&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1244.7&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1461.1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1631.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>50.30</td>
<td>*</td>
</tr>
<tr>
<td>FCR</td>
<td>3.61&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.58&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.23&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.11</td>
<td>*</td>
</tr>
</tbody>
</table>

T1: Arbor Acre
T2: Marshall
T3: Anak
T4: Cobb
SEM: standard mean of error
<sup>abcd</sup>: Means with different superscript are significantly different (p<0.05)
LOS: Level of significance
4.2 Discussion
It is well documented that growth, feed intake and physiological response are changed by environmental temperature. The results obtained in this study, with respect to weight gain, feed intake and feed conversion ratio, are in agreement with the temperature effects reported by others (Deaton et al., 1984; McNaughton and Reece. In this study, high temperature had a negative effect on feed and weight gain of almost all breeds used except for cobb breed. This is in agreement with work by (Sams, 1997; Mashaly et al., 2004) which revealed that physiological stress can have deleterious effects on the overall performance and body growth of meat-type poultry. Also, it may be attributed to influence of the harsh temperature which hampers their physical performance which is in corroboration with the finding of Donald (1998) that a greater number of physiological activities undergoes specific changes in birds exposed to hot environment. This was further enunciated by Becker et al. (2003) who elaborated the negative impact of heat stress on the behavioral response of animals to adjust to the altered environment. However, T4 (Cobb Breed) did not respond negatively to high temperature as expected. It had the highest weight gain of 1631.67g and better utilized the feed with 2.70 as its feed conversion ratio. This may be because of their genetic superiority. This corroborates with the study of Huwaida et al. (2011) which revealed that Cobb strain was not significantly affected by season unlike in Hubbard and Ross strains which are affected by season. This study reveals that Cobb strain genetic merits enable it to adapt to high temperature variation and therefore it is most suitable for rearing in the tropics.

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion
From this experiment, it can therefore be concluded that variation in temperature a weather parameter, affects the feed intake and growth performance of broiler. Also, T4 (Cobb breed) amidst high temperature has the highest weight gain and therefore performs best.

5.2 Recommendations
It is recommended that Cobb broiler can be reared conveniently during the dry season especially (January-March) of the guinea savanna without any stress. Also, to rear other breeds of broiler at this period, measures to control the environmental temperature should be made available. Further research should be done to compare Cobb broilers with other strains of broiler like Ross.

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ABSTRACT

Fish is a high-quality food rich in protein. A total of 130 species of *Marcusenius senegalensis*, *Chrysichthys nigrodigitatus*, *Schilbe intermedius*, *Clarias gariepinus* and *Elops lacerta* were obtained from Ogun River in Abeokuta. Fishing was by the means of gill and cast nets. The length-weight measurement, condition factor, stomach content analysis of the fish samples collected was studied. The result of the study showed that *Clarias gariepinus* had the highest length and weight range of 20.4-65.6 cm and 89-108 g respectively while *Elops lacerta* had the lowest length and weight range of 9.5-15.3 cm and 10.9-37.5 g respectively. The highest condition factor of 3.42 was found in *Marcusenius senegalensis* while the lowest of 0.69 was found in *Clarias gariepinus*. The regression coefficient indicated an allometric growth for all the fish species except for *Clarias gariepinus* in which the b-value was above 3. The stomach content analysis indicated that majority of the fish species are omnivores that feed on any available prey such as flagellates, insects, fish and some aquatic plant parts among others. *Nymphaea odorata*, *Eichhornia crassipes*, *Pistia stratiotes*, *Pennisetum pedicellatum*, *Crascocephalum crepidioides*, *Digitaria abyssinica* and *Pennisetum purpureum* were some of the plants identified in the near the river body. The study indicates that majority of the fish species are in a state of well-being however, the pollution of the river can be better managed as this will improve the quality of the aquatic life of the river.

Keywords: Condition factor, Fish, Length-weight measurement, Stomach content

1. INTRODUCTION

Fish is a high-quality food, rich in protein and vitamins with variable amount of fat and calcium. In Nigeria, there are abundant natural water bodies with high quantity of fish resources and it has been reported that freshwater bodies in Nigeria are the richest in West Africa as regards to abundance of fish (Meye and Ikomi, 2008). A comprehensive understanding of the conditions of fish species in a water body is an important management tool for a sustainable exploitation of the fishes. Regular biological surveys of fish species are thus very important in the management of fisheries (Oladipo, Mustafa, Suleiman and Anifowose, 2018).

Water bodies such as rivers, lakes and dams are valuable resources that serve many human needs and thus enhance our lives by providing many opportunities. Water bodies also serve as a source of animal protein and family income to many (Bolarinwa, Fasakin and Fagbenro, 2015). The condition factor shows the degree of the well-being of the fish in their habitat (Pervin and Mortuza, 2008). The study is aimed at determining the length-weight measurement, condition factor, stomach content of the fish species and the identification of flora found in Ogun River.

2. MATERIALS AND METHODS

A total number 130 of five different species belonging to five families were sampled from commercial catches of fishermen in Ogun River. The gears used in this study site were gill and cast nets. Immediately after the capture of the fishes, they were all taken to the laboratory. Each specimen was identified by means of identification key. The total length and standard length of the specimen were measured using a measuring board graduated in centimeters. The weight of the specimens was also recorded in grams using a weighing balance graduated in grams. The fishes were measured to the nearest centimeters and the weight to the nearest 0.1 grams, thereafter the fishes were dissected.

The condition factor was calculated using the equation:

\[
K = \frac{100W}{L^3}
\]

(Bagenal, 1967)

Where K = Condition factor
W = weight in grams
L = Length in centimeters

Each specimen of fish was dissected with the aid of dissecting set at the ventral side, starting from the anus to the beginning of the operculum. The gut was removed and the content of the stomach was carefully pressed out using forceps into a Petri dish. The content was carefully placed on a slide and observed under the microscope. Some large organisms in the gut were however identified without the aid of a microscope.

3. RESULTS AND DISCUSSION

Table 1: Frequency and percentage composition of fish species captured at Ogun River

<table>
<thead>
<tr>
<th>Sample</th>
<th>Fish species</th>
<th>Family</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Marcusenius senegalensis</td>
<td>Mormyridae</td>
<td>14</td>
<td>10.7</td>
</tr>
<tr>
<td>B</td>
<td>Chrysichthys nigrodigitatus</td>
<td>Claroteidae</td>
<td>43</td>
<td>33.1</td>
</tr>
<tr>
<td>C</td>
<td>Schilbe intermedius</td>
<td>Schilbeida</td>
<td>26</td>
<td>20.0</td>
</tr>
<tr>
<td>D</td>
<td>Clarias gariepinus</td>
<td>Claridae</td>
<td>28</td>
<td>21.5</td>
</tr>
<tr>
<td>E</td>
<td>Elops lacerta</td>
<td>Elopidae</td>
<td>19</td>
<td>14.7</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>130</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 2: Length-weight relationship and correlation coefficient of the fish species

<table>
<thead>
<tr>
<th>Length Range (cm)</th>
<th>Weight Range (g)</th>
<th>Condition Factor</th>
<th>Regression coefficient</th>
<th>Correlation coefficient (R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 10.5 - 15.73</td>
<td>49.3 - 74.2</td>
<td>3.42</td>
<td>Y = -0.650 + 0.976X</td>
<td>0.903</td>
</tr>
<tr>
<td>B 9.7 - 19.1</td>
<td>21.0 - 54.5</td>
<td>1.19</td>
<td>Y = 0.037 + 0.704X</td>
<td>0.988</td>
</tr>
<tr>
<td>C 10.0 - 17.4</td>
<td>46.8 - 103.3</td>
<td>1.95</td>
<td>Y = -0.208 + 0.726X</td>
<td>0.989</td>
</tr>
<tr>
<td>D 20.4 - 65.6</td>
<td>89 - 108</td>
<td>0.69</td>
<td>Y = -8.626 + 5.095X</td>
<td>0.746</td>
</tr>
<tr>
<td>E 20.4 - 65.6</td>
<td>10.9 - 37.5</td>
<td>1.27</td>
<td>Y = 0.594 + 0.368X</td>
<td>0.990</td>
</tr>
</tbody>
</table>

Table 3: Percentage of stomach contents of the fish species

<table>
<thead>
<tr>
<th>Fish Species</th>
<th>Percentage of stomach with food (%)</th>
<th>Percentage of stomach without food (%)</th>
<th>Stomach content</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>58.8</td>
<td>41.2</td>
<td>Fish, insect and insect larvae, eggs, algae</td>
</tr>
<tr>
<td>B</td>
<td>90</td>
<td>10</td>
<td>Crustaceans, insect parts, mollusks and some unidentified aquatic parts</td>
</tr>
<tr>
<td>C</td>
<td>75</td>
<td>25</td>
<td>Flagellates, diatoms, green algae, arachnids, some fish parts</td>
</tr>
<tr>
<td>D</td>
<td>78</td>
<td>22</td>
<td>Copepods, broken insect parts, some aquatic plant parts.</td>
</tr>
<tr>
<td>E</td>
<td>45</td>
<td>55</td>
<td>Green algae, diatoms, chlorophytes and some unidentified plant parts</td>
</tr>
</tbody>
</table>

A-Marcusenius senegalensis, B-Chrysichthys nigrodigitatus, C-Schilbe intermedius, D- Clarias gariepinus and E- Elops lacerta
A total of 130 fish species were caught during the sampling period. Five fish species namely; Marcusenius senegalensis, Chrysichthys nigrodigitatus, Schilbe intermedius, Clarias gariepinus and Elops lacerta were identified belonging to Mormyridae, Claroteidae, Schilbeidae, Clariidae and Elopidae families respectively. Table 1 shows the frequency and percentage of the fish species identified during the course of the study. The most abundant of the fish species were Chrysichthys nigrodigitatus which constituted 33.1% of the total percentage, followed by Clarias gariepinus with a percentage of 21.5%, while Chrysichthys nigrodigitatus was the least abundant with a percentage of 10.7%.

Condition factor is also a useful tool for monitoring of feeding intensity, age and growth rates in fish species (Kumolu-Johnson and Ndimele, 2010). However, it is strongly influenced by both biotic and abiotic environmental factors and can be utilized as an index for the assessment of the status of the aquatic ecosystem in which fish live (Anene, 2005). The condition factor (k) of the fish species in this study ranged between 0.69 and 3.42. Clarias gariepinus had the least condition factor of 0.69 while Marcusenius senegalensis had the highest condition factor of 3.42. Table 2 indicates that Marcusenius senegalensis, Chrysichthys nigrodigitatus, Schilbe intermedius and Elops lacerta have condition factor greater than 1. This means that the condition or environment in which the fishes reside is favorable, however, the condition factor of Clarias gariepinus was lower than 1. It has been reported by Nazeef and Abubakar, 2015 that condition factor of fish species is not constant but subject to variations at different points in time. All the fish species have a regression coefficient value less than 3 thus they showed positive allometric growth which means there is an unequal growth rate in different portions of the body that gives rise to the final shape.

Stomach content of the investigated fish species were tabulated in table 3. They include aquatic plant parts, copepods, broken insect parts, green algae, chlorophyles, crustaceans, sand particles, fish and fish parts. Some stomach contents were also macerated and the prey items could not be properly identified under the microscope. Nymphaea odorata, Eichhornia crassipes, Pistia stratiotes, Pennisetum pedicellatum, Crassocephalum crepidiodes, Digitaria abyssinica and Pennisetum purpureum were some of the plant identified in the near the river body.

4. CONCLUSION

In conclusion, this study has provided information on the wellbeing of the commercial fish species in Ogun river. Majority of the fishes assessed had allometric growth pattern. The condition factor also indicated that majority of the fishes were responding well to various ecological factors while the stomach content of the fish species showed they were feeding well. Although, the information provided in this study could serve as a preliminary information compared to an all year round intensive study to shed more light on the other biological aspects of the fish species such as reproductive biology, aging and growth determination and many more. It is however recommended that the water quality of the river body should be improved as it was highly polluted by anthropogenic activities and this can have an effect on the well-being of the aquatic life residing in it.

REFERENCES


BRIDGING THE GENDER GAP IN ENROLMENT INTO MECHANICAL ENGINEERING DEPARTMENT IN HIGHER INSTITUTIONS IN NIGERIA

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ABSTRACT
The focus of the paper is to examine the wide gap between the number of male and female students enrolment into mechanical engineering programme in some tertiary institutions in Nigeria with a view to proffer feasible solutions. The study employed descriptive research method for the investigation on the low enrolment of female students into mechanical engineering department in some schools in the South West, Nigeria, to illustrate the gross disparity. The choice of mechanical engineering as a profession is not in the radar of many female students seeking admission into higher institutions because of the perceived difficulty associated with mathematics, physics and technical drawing. The perception that mechanical engineering profession is unbefitting and hazardous for women is another major factors that is responsible for the low enrolment of female students into mechanical engineering departments of the institutions that were examined. The result of the comparative analysis of the data available confirmed the huge gap in favour of male students. Conclusion and recommendations were made based on the comparative analysis.

Keywords: mechanical engineering, profession, women, gender, inequality.

1.0 INTRODUCTION
The perceived domestic and traditional roles of African women have significantly affected their contribution to industrial and technological development in Nigeria. These historical roles have deprived many women of their potential and willingness to contribute to advancement in science and technology, and industrial development of the country. The socially approved functions, such as child bearing, farming and housekeeping has hindered many women from exhibiting their true values, even though many of them believe that they are truly destined for these historical functions (Adeleke, 1990). This impediment has denied the country of innumerable contributions that would have been made to the development of the country by the female citizens.

Mechanical engineering can be defined as the design, production, operation and maintenance of machines and machinery (Collins Dictionary, 2018). Mechanical engineering profession has evolved over the years to the extent that it touches practically all aspects of human activities. Recent technological development has further widened the broadness of mechanical engineering from automotive, manufacturing and energy conversion to automation, robotics and artificial intelligence. Although mechanical engineering is often regarded as a male dominated profession; therefore women view it as an aberration to opt for such course of study in the higher institution. This assertion has been rejected and demystified long time ago in the developed world because enlightenment sensitization and other proactive measures have been used to convince young female school leavers on the benefits of engineering education. (ASME Newsletter, 2002)

The career prospect and the varieties of career options that mechanical engineering profession offers are too enticing to be dominated by one gender. The challenges and opportunities in engineering profession has been exploited to full advantage by women in the developed world where they compete on equal level with their male counterparts. The first female graduate engineer in the USA, Elizabeth Bragg, graduated from the University of California at Berkley in 1876 while Bertha Lamine graduated from Ohio State University in 1894 with a degree in mechanical engineering, whereas in Europe, Alice Perry became the first woman to graduate with a degree in
engineering in 1906 from Queens College, Galway (Society of Women Engineers, 2019). Although, it was recorded that Elizabeth Bragg never practiced engineering as she was a housewife. Furthermore, few female engineers were reported to have graduated with a degree in engineering in USA until after the First World War because most colleges did not accept women (SWE, 2019).

The achievement of female engineers in the developed world validates the early awareness in engineering profession and the Science, Technology, Engineering and Mathematics (STEM) initiative has been used to diminish the gender gap in engineering education. In the USA, ‘Introduce a Girl to Engineering’ campaign has been utilized by the American Society of Mechanical Engineers (ASME) to publicize the need to involve more women in engineering education and career, as well as to reach out to high schools with encouraging messages about science education and engineering careers (Legarsky, 2002). The campaign has resulted in considerable increase in enrolment of female students into mechanical engineering programme. In addition, the initiative such as ‘For inspiration and Recognition of Science and Technology (FIRST) was employed by ASME to create awareness among high school students by forming teams with practicing engineers to built robots and awarding prizes for the best team (Bahner, 1996). These initiatives are meant to encourage young high school students, particularly the girl child, to opt for mechanical engineering as a career.

1.1 WOMEN AND ENGINEERING IN NIGERIA
The Association of Professional Women Engineers of Nigeria (APWEN), a division of the Nigerian Society of Engineers (NSE), was established in 1982 by some female engineers spearheaded by Engr. (Mrs) J. O. Maduka. The mandate of APWEN is to act as a catalyst for advancement of women in the engineering profession in Nigeria. In fulfilling the APWEN mission statement to continuously increase awareness of engineering education among girl child in Nigeria, the association is vigorously making efforts to increase the workforce of women engineers in Nigeria (Eterigho, 2018). Other attempts by APWEN to encourage and attract girl child into engineering profession are visits by APWEN members to primary and secondary schools for career talks, STEM competitions, establishment of graduate membership of APWEN in engineering institutions in the country and industrial visits by members to encourage engineering education among Nigerian girls.

The campaign to boost awareness on the derivable benefits of engineering education among girl child such as ‘Invent it. Build it’ initiative that was initiated in 2018 by APWEN is another bold step in the right direction. The awareness programme is to spread the message among school children, especially in the rural areas, by identifying a role model in the engineering profession that can promote the aims and objectives of APWEN. One major achievement of APWEN is the gradual increase of women in the membership of the Nigerian Society of Engineers in recent years. In addition, there has been sharp increase in the number of female enrolment into engineering programmes in Nigerian tertiary institutions which has positively impacted the profession and flaw the perception that engineering is a male dominated profession (Abdulqair, Shuaib-Babata, 2008).

The masculinity associated with engineering over the years is still very much apparent and it has underpinned the assertion that the profession is suitable for only male gender. Thus, women still formed small percentage of total enrolments in engineering departments in most of the tertiary institutions all over the world (Badakele, 2003). Although women constitute more than half the world population (50.6%), two-third of the world’s work hours, yet two-third of the word’s illiterate are women and the vast majority of the word poor are women (Abubakar, 2008). Therefore, it is glaring that more need to be done to improve the lots of women and one of way of enhancing and empowering women is by reducing the gap between male and female enrolment in mechanical engineering programmes and creating more awareness for engineering education in general.

2.0 METHODOLOGY
The paper employed descriptive research method and compared male and female enrolment into mechanical engineering departments in the Federal Polytechnic, Ilaro and University of Lagos. Three academic sessions were considered for both National Diploma (ND) and Higher National Diploma (HND) programmes in mechanical engineering from 2015/2016 to 2017/2018 in the Federal Polytechnic, Ilaro, while the data available for enrolment in 1995/1996 academic session in University of Lagos was considered. In addition, opinions from academic staff of mechanical engineering department and admission office were utilized to elicit information about the lopsidedness in the enrolment of male and female students into engineering courses in Nigeria tertiary institutions.

3.0 FINDINGS AND DISCUSSION
The findings from the student’s enrolment into the department of mechanical engineering in the Federal Polytechnic, Ilaro revealed that just 2% of the students admitted in 2015/2016 and 2016/2017 academic sessions were female, while female constituted 3% in 2017/2018 for National Diploma (ND) programme. There was
considerable improvement in the enrolment of female students in the Higher National Diploma (HND) programme. Female students constituted 20% in 2015/2016 and decline to 11% in 2016/2017 but slightly increased to 14% in 2017/2018 academic session. The trend did not change in the University of Lagos where 7% of the students admitted in 1995/1996 academic session were female. The data available is shown in table 1, 2, and 3 below, while the comparative bar charts are depicted in figure 1 and 2. The tables and the comparative bar charts illustrate the gross discrepancy in male and female enrolment into mechanical engineering programme in Nigeria higher institutions.

Table 1: National Diploma Enrolment (ND Programme)

<table>
<thead>
<tr>
<th>Academic Session</th>
<th>Male Enrolment</th>
<th>Female Enrolment</th>
<th>Total Enrolment</th>
<th>Percentage Female</th>
<th>Whose Favour</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015/2016</td>
<td>41</td>
<td>1</td>
<td>42</td>
<td>2</td>
<td>Male</td>
</tr>
<tr>
<td>2016/2017</td>
<td>130 (Full Time &amp; Part Time)</td>
<td>2</td>
<td>132</td>
<td>2</td>
<td>Male</td>
</tr>
<tr>
<td>2017/2018</td>
<td>30</td>
<td>1</td>
<td>31</td>
<td>3</td>
<td>Male</td>
</tr>
</tbody>
</table>

Table 2: Higher National Diploma Enrolment (HND Programme)

<table>
<thead>
<tr>
<th>Academic Session</th>
<th>Male Enrolment</th>
<th>Female Enrolment</th>
<th>Total Enrolment</th>
<th>Percentage Female</th>
<th>Whose Favour</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015/2016</td>
<td>45</td>
<td>11</td>
<td>56</td>
<td>20</td>
<td>Male</td>
</tr>
<tr>
<td>2016/2017</td>
<td>59</td>
<td>7</td>
<td>66</td>
<td>11</td>
<td>Male</td>
</tr>
<tr>
<td>2017/2018</td>
<td>61</td>
<td>10</td>
<td>71</td>
<td>14</td>
<td>Male</td>
</tr>
</tbody>
</table>

Table 3: Enrolment in Mechanical Engineering Department, University of Lagos (1995/1996)

Source: Academic Planning Unit, University of Lagos (1996)

<table>
<thead>
<tr>
<th>Year (Level)</th>
<th>Male Enrolment</th>
<th>Female Enrolment</th>
<th>Total Enrolment</th>
<th>Percentage Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>86</td>
<td>6</td>
<td>92</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>46</td>
<td>3</td>
<td>49</td>
<td>6</td>
</tr>
</tbody>
</table>

Figure 1: Comparative Bar Chart of ND Enrolment of Male and Female Students in Department of Mechanical Engineering, Federal Polytechnic, Ilaro (2015 to 2018)
4.0 CONCLUSION AND RECOMMENDATIONS

It is obvious from all indications that the abysmal picture painted by this disparity started during the colonial years. However, the formation of the Association of Professional Women Engineers in Nigeria (APWEN) in 1982 open a new chapter in engineering profession among women in Nigeria, because APWEN has brought the issue into the front burner and lay bare the challenges impeding the growth of the profession as a career among women. Furthermore, efforts by international engineering associations such as the Society of Women Engineers (SWE), the American Society of Mechanical Engineers and the Nigerian Society of Engineers (NSE) has continue to yield positive result in abating the ugly trend in disparity. Other women association such as Women in Technical Education and Employment (WITED) should also step up the campaign for more female participation in engineering activity.

WITED and other stakeholders in engineering education should strive to ensure that the female gender, as the true mother of the nation, remains a key player and partaker where critical decisions concerning women are to be formulated. Additionally, APWEN should design a way of monitoring and enforcing every decision regarding engineering education in the country. This will go a long way in realizing the mission statement of APWEN to continuously increase the awareness that engineering is a career for girls, as well as promote the engineering profession in a positive force in enhancing the quality of life. Equally, APWEN and WITED should ensure that Nigerian women will form part of the generation that will raise future leaders in mechanical engineering profession. The following recommendations are imperatives in order to fast track the awareness of engineering profession among girl child:

- It has been observed that the stereotype surrounding engineering profession as a masculine profession can be reduced drastically if organizations such as SWE, APWEN and WITED can intensify their efforts to break the jinx associated with mathematics, science and engineering disciplines.
- The erroneous notion that mechanical engineering is dirty, stressful and incongruous with the traditional profession for women (e.g. teaching and nursing) should be discarded.
- Concerted effort should be made to involve more female engineering professionals in all activities of engineering associations.
- The balance between career and family life, which can pose serious problem in a marriage, can be managed if individual can prioritizing their daily activity.
- The long-established view that women belong to the kitchen should be expunge from anything that has to do with Nigerian women.
Seminars and workshops by professional associations, successful engineers and engineering entrepreneurs should be encouraged to sensitize girl child in secondary schools and female students in higher institutions.

REFERENCES
ROLE OF WOMEN IN AGRICULTURE FOR SUSTAINABLE ECONOMIC DEVELOPMENT: `A CONCEPTUAL REVIEW

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ABSTRACT
The study assessed the contribution of women to agriculture for economic sustainability. The study aimed at achieving three objectives viz: evaluating the extent of women participation in agricultural production, identifying the constraints faced by women in their participation in agriculture and to also investigate the impact of government on women participation in agriculture. The study also aimed at proffering policy options that can expedite the role of government in mainstreaming women participation in agriculture. From literature reviewed in the study, it was discovered that government have been making positive impact in mainstreaming women into agriculture in Nigeria through its various programmes. However, poor access to farm machinery and market are the main problems being faced by the women. The study concludes that women were significantly participating in agriculture in Nigeria and as a concomitant, the study recommended the establishment of contract/out-growing farming system in order to ensure consistent and steady farm output prices and machinery supply.

Keywords: Farming, Agriculture, Government, Mainstream, Machinery.

1 INTRODUCTION
In Nigeria, the involvement of women in agriculture has attracted greater attention in recent years. The need to develop a suitable extension service that is gender specific cannot be overemphasized. This is in recognition that women play significant roles in Nigeria’s agricultural production, processing and utilization. The United Nations report of 2017 asserts that women contribute 43% to the agricultural labor force in developing countries, ranging from about 20% in Latin America to almost 50% in East and South-east Asia and Sub-Saharan Africa. Some sources even claim that in many African countries up to 80% of farm labor is done by women. This necessitates their integration into planning, policies and programs for effective and sustainable development of a nation (FAO, 2003). The Nigerian government has continued to make developmental plans, which aims at poverty alleviation and provision of an enabling environment for rural women, with little intervention for women living in urban areas.

Women play important roles in agriculture, undertaking a wide range of activities relating to food production, processing and marketing; and beyond farming, they are involved in land and water management; most often they are collectors of water, firewood and fodder. They have access to store of local knowledge on the medicinal use of plants; they have been at the forefront of soil conservation programmes; and it is women who perform most of the household labour devoted to animal (Commonwealth, 2005).

According to Balikisu (2011), women participation in agricultural production cuts across various subsectors: planting, weeding, harvesting, processing and marketing as well as tending livestock (Soubh, 2006). Hence, the role of women in agricultural production in the developing nations, including Nigeria, can never be overemphasized (Damisa & Yohanna, 2007; & Kishor; Gupta, Yadav, & Singh, 1999).

Although, rural out-migration has constituted one of the greatest challenges hindering agricultural development in developing countries. Survey has showed that in general, women in Africa have a strong desire to participate in their community affairs and contribute to its development (African Development Fund – ADF, 2003) provided that there is government effective and timely support/subsidization to agricultural sector; employment opportunities in the local area, including part-time jobs; the possibility of gaining work experience and vocational qualifications; local facilities for education and training; business services supportive to women’s projects and enterprises; public transport services compatible with working hours; local childcare facilities and social services for the elderly and the sick; and supportive public and professional organizations.

The international development community has recognized that agriculture is an engine of growth and poverty reduction in countries where it is the main occupation of the poor. Rural women often manage complex
households and pursue multiple livelihood strategies. Their activities typically include producing agricultural crops, tending animals, processing and preparing food, working for wages in agricultural or other rural enterprises, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes. Many of these activities are not defined as “economically active employment” in national accounts but they are essential to the wellbeing of rural households. This paper contributes to the gender debate in agriculture by assessing the empirical evidence in three areas that has received much attention in the literature. But the agricultural sector in many developing countries is underperforming, in part because women, who represent a crucial resource in agriculture and the rural economy through their roles as farmers, labourers and entrepreneurs, almost everywhere face more severe constraints than men in access to productive resources. Efforts by national governments and the international community to achieve their goals for agricultural development, economic growth and food security will be strengthened and accelerated if they build on the contributions that women make and take steps to alleviate these constraints.

Women make essential contributions to the agricultural and rural economies in all developing countries. Their roles vary considerably between and within regions and are changing rapidly in many parts of the world, where economic and social forces are transforming the agricultural sector. Rural women often manage complex households and pursue multiple livelihood strategies. Their activities typically include producing agricultural crops, tending animals, processing and preparing food, working for wages in agricultural or other rural enterprises, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes. Many of these activities are not defined as “economically active employment” in national accounts but they are essential to the wellbeing of rural households.

### 1.1 Agriculture as the Engine of Poverty Reduction

Balikisu (2011) and Overseas Development Institute – ODI (2002) identified some reasons for believing that agriculture is the engine of poverty reduction: when agriculture prospers, farmers and farm labourers benefit, and so do those with jobs upstream and downstream from farming; the wider economy also benefits from increased spending, likelihood of greater tax revenue, more investment in infrastructure, and a stronger foreign exchange position. It was also found that the impact of agricultural growth on poverty reduction is one and half times the impact of growth in other sectors (ODI, 2002).

### 1.2 The Historical Evidences

The historical evidences prove that agricultural sector has the potentials to be the industrial and economic springboard from which a country’s development can take off as its activities are usually concentrated in the less-developed rural areas where women represent the highest vulnerable groups with a critical need for (rural) transformation, redistribution, poverty alleviation and socio-economic development (Stewart, 2000; Eicher & Witt, 1964; Oluwasanmi, 1966; Ones & Woolf, 1969).

### 1.3 The impact of Agricultural Development Projects (ADPs)

This scenario of agriculture losing its position in the economy led to the introduction of Agricultural Development Projects (ADPs) in the late 1970s by the Nigerian government. The ADPs were designed in response to a fall in agricultural productivity, and hence a concern to sustain domestic food supplies, as labour had moved out of agriculture into more remunerative activities. The ADPs are to provide agricultural investment and services, rural roads, village water supplies, and mainstreaming of women into agricultural activities. The government’s adoption of the ADP concept put the smallholder farm participation at the centre of the agricultural development strategy (Independent Evaluation Group – IEG, 2009).

### 1.4 Women do the task than Men do

Women produce 60-80 percent of the world’s food, and women are inherently better stewards of the environment than men. Or are they? Although frequently repeated, many such “truths” about women in agriculture are increasingly being debunked.

The myth of the noble and responsible rural woman still permeates many development initiatives. Within this narrative, all rural women have unwittingly been appointed the caretakers of not only the household, but also farms and landscapes. This persistent discourse leaves women shouldering an unreasonable share of responsibility, and its misconceptions results in ineffective and, at times, counter-productive efforts to increase gender equity in agriculture.

The millions of women engaged in agriculture across the globe are a heterogeneous group with vastly different realities, opportunities and challenges. Today, their roles are changing as part of the constantly evolving social, environmental, cultural and economic contexts they live in. This complexity makes it challenging to design and implement interventions to improve gender equity in agriculture.
Yet, doing just so—increasing equity—is a prerequisite for achieving sustainable intensification of agriculture, concludes a recent synthesis of three years of gender research carried out by the CGIAR Research Program on Water, Land and Ecosystems (WLE).

It goes on to say that increased equity is both a practical and a social justice issue. Practical because, after all, women make up half the population and play an important (however varied and evolving) role in agriculture. Ensuring that women have opportunities to participate in making food systems more sustainable therefore increases the chances that such a transformation will succeed. Equity is a social justice issue because some of the old gender myths do hold true—in many cases, women have less access and control, fewer rights and opportunities, than men.

The simple answer is that there is no single truth about the role of women in agriculture today. There are many truths, and it is imperative that development interventions and investments are based on solid understandings of gender roles and dynamics in the local context. Over the past three years, researchers have been shedding light on such dynamics, and have developed approaches to better understand them.

In order to make this research more valuable, answers must be provided to the following questions:

1. What is the extent of women participation in agricultural sustainability?
2. What are the constraints being faced by Women in their participation in agriculture?
3. To what extent has Agricultural Development Project impacted on women Participation in agriculture since inception?

2 ROLE OF WOMEN IN AGRICULTURE AND ITS ALLIED FIELDS

Women play a significant and crucial role in agricultural development and allied fields. The nature and extent of women's involvement in agriculture varies greatly from region to region. But regardless of these variations, women are actively involved in various agricultural activities.

As per Census 2011, out of total female main workers, 55 per cent were agricultural laborers and 24 per cent were cultivators. However, only 12.8 per cent of the operational holdings were owned by women, which reflect the gender disparity in ownership of landholdings in agriculture. Moreover, there is concentration of operational holdings (25.7 per cent) by women in the marginal and small holdings categories.

Rural women perform numerous labour intensive jobs such as weeding, hoeing, grass cutting, picking, cotton stick collection, separation of seeds from fibre, keeping of livestock and its other associated activities like milking, milk processing, preparation of ghee, etc. Details of activities taken up by women in Agriculture and its allied activities are as follows.

2.1 Agriculture

Mainly rural women are engaged in agricultural activities in three different ways depending on the socio-economic status of their family and regional factors. They work as paid labourers, cultivators, managers of certain aspects of agricultural production by way of labour supervision and the participation in post-harvest operations. The types of agricultural activities taken up by women includes sowing, nursery management, transplanting, weeding, irrigation, fertilizer application, plant protection, harvesting, winnowing, storing etc.

2.2 Livestock

Livestock is the primary livelihood activity used to meet household food needs as well as supplement farm incomes. It is a common practice in the rural areas to give an animal as part of a woman's dowry. Studies have revealed rural women earn extra income from the sale of milk and animals. Mostly women are engaged in cattle management activities such as cleaning of animal and sheds, watering of cattle, milking the animals, fodder collection, preparing dung cakes, collection of farm yard manure. Except grazing, all other livestock management activities are predominantly performed by women. Men, however, share the responsibility of taking care of sick animals. It is evident that women are playing a dominant role in the livestock production and management activities.

2.3 Poultry

Poultry farming is one of the major sources of rural economy. The rate of women participation in poultry farming at household level is central in poultry industry.

2.4 Feminization of Agriculture

Economic Survey 2017-18 says that with growing rural to urban migration by men, there is ‘feminization’ of agriculture sector, with increasing number of women in multiple roles as cultivators, entrepreneurs, and
labourers. Globally, there is empirical evidence that women have a decisive role in ensuring food security and preserving local agro-biodiversity. Rural women are responsible for the integrated management and use of diverse natural resources to meet the daily household needs. This requires that women farmers should have enhanced access to resources like land, water, credit, technology and training which warrants critical analysis in the context of India. In addition, the entitlements of women farmers will be the key to improve agriculture productivity. The differential access of women to resources like land, credit, water, seeds and markets needs to be addressed.

With women predominant at all levels-production, pre-harvest, post-harvest processing, packaging, marketing – of the agricultural value chain, to increase productivity in agriculture, it is imperative to adopt gender specific interventions. An ‘inclusive transformative agricultural policy’ should aim at gender-specific intervention to raise productivity of small farm holdings, integrate women as active agents in rural transformation, and engage men and women in extension services with gender expertise.

2.5 Women constraints in farming

The low economic status of women limits their opportunities for broader participation in society. This is compounded by the trouble women experience in child-bearing and rearing. African culture discriminates a lot against women and girls, especially in the area of inheritance (land). Culture is not static and in modern-day Nigeria, it is subject to pressure and influences. Modern education and the development of technology and information have introduced Nigerians to new cultural concepts and norms. Since culture is not static, the forces of social change may be expected to lowering the barriers against Land tenure system should be reviewed and changed since the world is also changing. Credit facilities and input should be made available through farmers’ cooperative societies and families. The existing women’s group in the village should be organized and strengthened to increase women’s access to extension services, credit facilities, agricultural inputs and even marketing services. More female extension workers should be trained and sent to help female farmers. It is necessary to particularly identify women as an integral part of the agricultural extension policy and develop gender-specific operational guidelines which will direct the extension activities of women farmers. Input should be sold to farmers at subsidized rate and on time to avoid late supply.

2.6 Women’s key role in Agricultural Production emphasized

African leaders called for greater investment in women in order to increase agricultural production and improve livelihoods, at a three-day Sharefair on Rural Women’s Technologies to Improve Food Security, Nutrition and Productive Farming held in Nairobi, Kenya between October 15th and 16th, 2014.


Held in Nairobi, Kenya to coincide with the International Day of Rural Women on 15 October and World Food Day on 16 October, 2014 the exhibition was organized jointly by UN Women, the Food and Agricultural Organization (FAO) and the International Fund for Agricultural Development (IFAD), in collaboration with the African Union Commission (AUC). It highlighted opportunities to invest in technologies that support rural women, with approximately 100 technologies from 14 countries in the region displayed.

Her Excellency Rhoda Peace Tumusiime, Commissioner for Rural Economy and Agriculture at the African Union, opened the event by noting that women contribute significantly to household investments, community resilience, national economic growth and the vibrancy of regional economies.

She said women play a predominant role in African agriculture. They stand out as pillars of economic growth, especially when it comes to agriculture and agribusiness, which dominate rural economies throughout Africa, Ms. Tumusiime said.

UN Women Regional Director for East and Southern Africa, Christine Musisi, challenged governments and financial institutions in the region to prioritize support for female farmers through policies, funding and programming – an investment she said will accelerate agricultural growth while addressing food security.

Ms. Musisi noted that women are central to all aspects of agriculture and off-farm activities in their communities. Despite this, their efforts are often hampered by their lack of access to productive resources, technologies, services and markets.

High-level policy discussions and panels with regional and national government officials, and other sector leaders, took place concurrently with the exhibitions. These highlighted efforts on gender-sensitive agricultural and nutrition policies; identification of promising technologies and addressing the constraints to scaling up innovations.
3 Conclusion

The contribution of women in agricultural development for sustainable economy cannot be over-emphasized. Following from the preceding discussion, the following conclusions were reached by the study:

Agricultural undertakings are found to be the work of youth and adult among the women in the study area. Sampled women aged 18 – 57 years are those found in agriculture and none of those above 58 years of age were identified to be engaging in agricultural undertakings. An agricultural undertaking in the study area is also seen as a supportive mechanism given that widow and the divorced dominate in the participation.

The study also found that women participation in agriculture in the study area is significant. This is due to their involvement in the three forms of participation identified in the study: participating all year round, participating seasonally (sometimes) and participating in vegetable garden. The farm produce of majority of women was also found to be greater than 1 Ton even though small farm land (1 – 2 hectares) is prevalent among the sampled women.

The major problem facing women farmers in the study area is poor access to farm machinery as majority depend on commercial equipment thereby making them to employ labour intensive technique of farming. The sampled women also identified non access to efficient market as well as poor prices for their farm produce.

Government was found to have positively impacted on women participation in agriculture in the study area. This was achieved through the effort of government in organizing sampled women into farm group and introducing exclusive women agricultural programme: women in agriculture. Federal government also embark on the provision of basic farm input to women in the study area which they have rated as best and good: chemical/fertilizer, extension services, and improved seedling while capital and farm machinery programmes are not effective.

4 Recommendations

Based on the findings of the study, the following recommendations are imperative:

1. The government should introduce programmes that will encourage the youth and adults to remain in agriculture sector. These programmes should also address the plight of the widow and the divorced who are the majority participants among the women.

2. Government should formulate and implement policy on land tenure system that will give women adequate access to farming land so that their farm land could improve to medium (4 – 5 hectares) and even large (at least 7 hectares). In this policy, land allocation for residential and industrial development should be clearly distinguished from agricultural lands.

3. Contract and out-growing farming system should be developed in the state as a way of ensuring consistent market and steady agriculture output prices. This will enable women farmers the opportunity to earn high income from their participation in agriculture and help in the fulfillment of their dreams. These systems of farming can also help reduce poor access to farm machinery as the involved agro – allied industries and other participants will make some of the required machinery available to those women farmers that may be involved.

4. Government should redesign its programmes and projects towards becoming women focus as this will provide them the opportunity to develop and utilize their endowed potentials thereby making competitive and efficient in agriculture and home management as well.

References


THE EFFECT OF GENETICALLY MODIFIED CROPS ON POULTRY PRODUCTION (A REVIEW)

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ABSTRACT
Genetically modified organisms -- plants and animals whose genes have been altered by scientists – aren’t just thought over, they are fought over. Scientists create today’s genetic changes, or modifications. They alter the DNA of seeds with radiation or chemicals, and then choose which resulting plants to breed. Or they can snip a gene (or several) from a plant, virus, or bacteria and plug it into another to transfer a desired feature. GMOs often make news related to the environment, world hunger, the economy, politics, and yes, even health. GM crops are promising to mitigate current and future problems in commercial agriculture with proven case in the development and approval of the Pod Borer Resistant Cowpea (popularly called Beans) in Nigeria. With the rise in production of broiler for human consumption it is essential to study the necessary attribute of feeding broilers with genetically modified crop. The main objective of this paper is to provide a comprehensive overview of genetically modified crop, its benefit and challenges.

Keywords: Genetically modified Organism, poultry, health.

1. INTRODUCTION
Several critical societal issues, including climate change, water use, biodiversity, food security, early childhood nutrition and food are all associated with Agriculture. The introduction of GMOs in Nigeria started in 2001 with the establishment of the National Biotechnology Development Agency (NBDA). Earlier; Nigeria had signed and ratified an international treaty known as the Cartagena Protocol on Biosafety in 2000 and 2003. The IITA and USAID-sponsored Nigeria Agriculture Biotechnology Project (NABP) launched in November 2003 to support the expansion of GM food in Africa (premium,2019). Improvements in animal productivity (growth rates, milk production, etc.) are critical to increasing the efficiency of animal production. Genetic modification (GM) is the area of biotechnology which concerns itself with the manipulation of the genetic material in living organisms, enabling them to perform specific functions. The pro-GMOs in Nigeria argued that its introduction will boost food production, promote sustainable agriculture and help avert the climatic problems associated with the global warming (Ajayi, 2017). The use of genetically modified organisms (GMOs) to boost agricultural productivity and reduce food insecurity in Nigeria has generated a lot of debate. The level of poverty and illiteracy of the majority of Nigerian farmers, it is not surprising that the emergence of genetic engineering and its application to farming techniques was viewed with suspicion in many places. However, given the concerns on the use of GMOs products, thorough research on safe application of GMOs is required.

2.0 LITERATURE REVIEW

2.1 Overview of Genetically Modified Organism
The developments leading to modern genetic modification took place in 1946 where scientists’ first discovered that genetic material was transferable between different species. This was followed by DNA double helical structure discovery and conception of the central dogma – the transcription of DNA to RNA and subsequent translation into proteins – by Watson and Crick in 1954. In agriculture, the first GM plants – antibiotic resistant tobacco and petunia – were successfully created in 1983 by three independent research groups. In 1990, China became the first country to commercialize GM tobacco for virus resistance. In 1994, the Flavr Savr tomato (Calgene, USA) became the first ever Food and Drug Administration (FDA) approved GM plant for human consumption (Ruchir, 2017). This tomato was genetically modified by antisense technology to interfere with polygalacturonase enzyme production, consequently causing delayed ripening and resistance to rot. In Nigeria, the institute for agricultural Research, Ahmadu Bello University, Zaria released the first genetically modified
crop (Pod Borer resistant cowpea). The introduction of the GM cowpea will address the national cowpea demand deficit of about 500,000 tonnes and also improve the national productivity average of 350kg/hectare.

GM crops have been recorded to reduce environmental and ecological impacts, leading to increases in species diversity. It is therefore unsurprising that GM crops have been commended by agricultural scientists, growers and most environmentalists worldwide (Meyer et al., 2006). Nevertheless, advancements in GM crops have raised significant questions of their safety and efficacy. The GM seed industry has been plagued with problems related to human health and insect resistance which have seriously undermined their beneficial effects. Current agricultural practices alone cannot sustain the world population and eradicate malnutrition and hunger on a global scale in the future.

2.2 Imperfections in Genetically Modified Crop Technology
Despite the above controversies being proven unfounded, GM crops are an “imperfect technology” with potential major health risks of toxicity, allergenicity and genetic hazards associated to them. These could be caused by inserted gene products and their potential pleiotropic effects, the GMO’s natural gene disruption or a combination of both factors. The most notable example of this is Star link maize (Carter et al, 2007).

2.3 Challenges of GM crops
GM crops are crops with altered DNA or rather mixing of genes (removal of gene from a desired plant and inserting into another). By mixing genes from totally unrelated species, genetic engineering generates a host of unpredictable side effects. Moreover, irrespective of the type of genes that are inserted, the very process of creating a GM plant can result in massive collateral damage that produces new toxins, allergens, carcinogens, and nutritional deficiencies (Zhang et al, 2016). The factors stated above has direct effect on the food safety and food security, cases have been reported where GM crops approved for animal feed and industrial use were detected at low levels in the products intended for human consumption (Bawa et al, 2013). Anti-GM activists also argued that, due to monopoly of power, GM crops would result in input costs and decrease diversity of seed choice, thereby forcing out poorer farmers from farming and allowing a form of corporate-capitalist to dominate agriculture. These risks would be compounded by potential threats to biodiversity from the spread of GM genetic materials and consumers could be at risk from potentially unsafe foods (Ajayi, 2017).

2.4 Ethical concern about GM foods
A key ethical concern about GM foods is their potential to trigger allergies or disease in humans. Given that a gene could be extracted from an allergenic organism and placed into another one that typically does not cause allergies, a person may unknowingly be exposed to an allergen. in turn, this could lead to an allergic reaction. There is also the fear that new allergies could occur from the mixing of genes from two organisms. Disease is a major health worry with regards to GM foods. Given that some of the crops modified are done with DNA from bacteria and virus, there is concern that a new disease may occur in humans who consume the GM foods.

With some GM crops having antibiotic-resistant marker genes, there is also the worry that these genes could be passed onto microbes that cause disease and health problems in human. Damage to the environment is another ethical fear with regards to GM crops. Unfortunately, the technology is still new enough that there is much we do not know about the effect of GM crop production on the environment. Long-term studies take decade to complete and most studies of GM crop production involve short-term effects of the technology. An animal could also consume the GM crop itself, which means that if the crop has been engineered to produce a pesticide, the animal will be in health danger.

3.0 FINDINGS
3.1 Increasing Population Growth
The Food and Agricultural Organization projects the global population to grow to approximately 9.7 billion by 2050 – a near 50% increase from 2013 – and further to an estimated 11bn by 2100 (FAO, 2017). Current agricultural practices alone cannot sustain the world population and eradicate malnutrition and hunger on a global scale in the future. Indeed, the FAO also estimates that despite a significant reduction in global hunger, 653 million people will still be undernourished in 2030. Further studies shows that the four major crops cultivated globally (soybean, maize, wheat and rice) are increasing at 1.0%, 0.9%, 1.6% and 1.3% per annum respectively– approximately 42%, 38%, 67% and 55% lower than the required growth rate (2.4%/annum) to sustain the global population in 2050 (Ray et., al 2013).
3.2 Relevance of GM crops to developing countries

Most commonly, the improvement of plants aims to increase the yield or quality of crops. Yield is influenced by many factors including pests, diseases, soil conditions, or abiotic stresses (Ruchir, 2017) which stem from unfavorable climatic conditions. Significant improvements can often be achieved by means of irrigation, the application of insecticides or pesticides and the addition of fertilizer. However, most of these interventions are expensive, particularly for small-scale farmers in developing countries. The use of genetic modification provides plant breeders with new opportunities to produce crops that are protected from environmental stresses and attacks from pathogens and insects.

3.3 Solution Provided by GM Crops

Genetically modified (GM) crops have been largely successful in proffering solutions to the major challenges facing agriculture and at the same time providing numerous benefits to growers worldwide. GM crops have been widely adopted by growers because they benefit from the introduced traits that help protect plants from insect damage, to maximize yield on minimal acreage (Ray et al, 2013). The global yearly net income increased by 34.3% in 2010–2012 (Brookes et al. 2014). Furthermore, while increasing global yield by 22%, GM crops reduce the use of pesticides and fertilizers because of pest-resistance quality in their transgenic make-up (Klumper et al. 2014). GM allows crops to be bred by selectively inserting one or more genes into a plant. So, plants that are resistant to pests and diseases can be reproduced, hence the reduction of the amount of pesticide used on crops. Therefore, farmers do not need to spray pesticides that are harmful to the crops as well as humans and animals. Thus, this reduction in the use of insecticides and pesticides will help in saving fossil fuels and lowering greenhouse gases emission, thereby fighting against unhealthy climate change (Adenle, 2011). The introduction of GM foods to Nigerian farming system can therefore be a good start to solving malnutrition and also tackling the issue of global earth warming.

4.0 CONCLUSION/RECOMMENDATION

4.1 Conclusion

In spite of the fact that every major global regulatory group has approved the safety of the crops they have reviewed, there continues to be some concerns. Consumers often deal with confusing information that does not explain the benefits of biotechnology; therefore, GM seed providers and agricultural scientists need to be able to provide accurate information to make science-based decisions and to understand their benefits to reducing the impact of agriculture on use of land and other resources. In spite of the concerns and health risks associated with the adoption of GM foods in Nigeria, GMOs have a vital role to play in addressing the problem of acute food shortage in the country. Although the GMOs can be a basis for increasing food production without expansion of land to cultivate, it is important to acknowledge that the implementation of GM crops may be a useful element for the fight against hunger.

4.2 Recommendation

Further research should be carried out on the health implications of genetically modified (GM) crops on animals and humans in an unbiased environment free from personal interest and political motives.

REFERENCES


ASSESSMENT OF MATERNAL NUTRITIONAL KNOWLEDGE, SOCIO-ECONOMIC STATUS AND NUTRITIONAL OUTCOME OF UNDER-FIVE CHILDREN IN ILARO, OGUN STATE

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Federal Polytechnic Ilaro, Ogun State
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ABSTRACT
The study was carried out to assess the maternal nutritional knowledge, socio-economic status and nutritional outcome of under five children in Ilaro Area of Ogun State, Nigeria. A sample of two hundred and forty (240) respondents was randomly selected for the population. The instrument used in collecting data was the structured questionnaire showing personal information of the parent and the children, and the anthropometric measurement of under five children. The findings revealed that majority (59.2%) of the parent (respondents) are between 41 to 50 years of age. All the respondents were female. The findings showed the anthropometric measurement of children in which height of respondents ranged between 80cm and above (57.5%), the weight of respondents ranged between 10-15kg (60.0%). In addition, findings revealed that 55.8% of the respondents were mildly underweight, 62.5% had normal stunted growths while 51.7% had normal wasted growth. The results indicated that there was adequate maternal nutritional knowledge of the parents in relation to the nutrition of their children. The study concludes that food intake of children under the age of five (5) in the study area established a significant relationship with children’s age, weight, parents occupation and parent income, yet nutritional related problems exist among the under-five children in the study area. It is therefore recommends that children should be given meals that contain all classes of food nutrients in order to prevent the incidence of malnutrition, underweight, stunted growth and wasted growth and also nutritional counselling should be done for the mothers of the under-five to reduce the prevalence of nutritional related problems.

Keywords: Children, Malnutrition, Nutrition, Parent

1. INTRODUCTION
Nutritional status of the under-five is of great importance since this period of life is considered as pivotal for adequate growth (Badake et al., 2014). Under-nutrition could be described as weighty medical condition characterized by a deficient bodily nutrition (energy, essential proteins, fats, vitamins, and minerals in a diet) as a result of inadequate food intake or faulty assimilation. Over 10 million children of under-five are lost annually due to diseases that can be prevented and even easily treated. Most of these illnesses and majority of these deaths occur in developing countries because of the poor economy of such countries (Black, Morris & Bryce, 2003). Malnutrition cause more over 30% of all children’s deaths who are under-five(United Nations Children's Fund (UNICEF), 2009). According to Badake et al., (2014), assessing the growth of children is a good parameter to look at the development of the children and this also gives insight about food security in the area and assess to good health services. According to Hunger Facts (2015), globally about 795 million individuals are undernourished. The vast majority (98%) of these undernourished reside in the developing countries. Under-nutrition among the under-five remains a problem faced by different parts of the world. Close to 50% of all deaths among under-five are attributable to under nutrition. This implies that there is unnecessary loss of about 3 million young lives every year (Hunger Facts, 2015). Nigeria (especially the rural areas) is one of the developing countries that are affected by this nutrition-related problem. This might be related to causes that are found in other regions of the world like poor access to food, primary care giver factor, socio-economic factor, area of abode and other related factors. The Nigeria Demographic and Health Survey (2003) put the rate of stunted growth among the under-five years to be 38%, underweight to be 29% while wasting was 9.2%. Several factors can be considered to have caused these nutritional deficiencies. According to the Federal Ministry of Health (FMOH) Nigeria (2007), 7% is the rate of compliance of mothers to exclusive breastfeeding of their children who are less than 6 months.

The right to adequate food is recognized in several instruments under international law. Despite this recognition, globally, half of the almost 10 million children under the age of five who die annually do so from a combination of malnutrition and easily preventable disease. The world Health Organization estimates that Approximately
150 million children younger than 5 years in developing countries are underweight and an additional 200 million children are stunted (WHO, 2007). In Nigeria, malnutrition under five children contributes major current health problems (morbidity and mortality) in several ways. Under nutrition remains a devastating problem in many developing countries affecting over 815 million people causing more than one –half of children death. The main objective of this study is to assess maternal nutritional knowledge, socio-economic status and nutritional outcome of under five children in Ilaro Area of Ogun State. The specific objectives are to:

i) Describe the socio economic characteristics of the parents of under five children in the study area
ii) Examine the feeding practices engaged in by mothers of under-five children in the study area
iii) Describe the nutritional status of the under-five children using anthropometric index of under-five children in the study area
iv) Describe the knowledge and practice of mother about nutritional status of the under-five children in the study area.

2. METHODOLOGY

The study was carried out in Ilaro, ogun state is a town in Ogun State, Nigeria. Ilaro town has about 46,999 people (NPC, 2014). Ilaro is a headquarters of the Yewa South Local government, now known as YEWA LAND which replaced the Egbado division of the formal Western State and later became a part of ogun state of Nigeria. Ilaro town is about 50km from Abeokuta, the ogun state capital and about 100km from ikeja, the capital city of Lagos state other neighboring towns to ilaro, headquarters of Yewa land include, Ajilete, Oke-OdanOwode: Ibese, OjaOdan, Pahayi, Idogo- Ipaja, Papalanto and Imasayi. Primary data used for this study was collected with the aid of two hundred and forty well-structured questionnaire using simple random sampling techniques with households being the unit of analysis. Data collected were analysed using descriptive statistics.

Sampling techniques and sampling size of the respondent

Table 1

<table>
<thead>
<tr>
<th>COMMUNITIES</th>
<th>NO OF HOUSEHOLD</th>
<th>NO OF MOTHERS</th>
<th>NO OF CHILDREN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Okeola</td>
<td>23</td>
<td>27</td>
<td>41</td>
</tr>
<tr>
<td>Gbogidi</td>
<td>20</td>
<td>22</td>
<td>45</td>
</tr>
<tr>
<td>Dosunmu</td>
<td>25</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>Express</td>
<td>26</td>
<td>30</td>
<td>42</td>
</tr>
<tr>
<td>Ikosi</td>
<td>29</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Pahayi</td>
<td>27</td>
<td>31</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td><strong>150</strong></td>
<td><strong>165</strong></td>
<td><strong>240</strong></td>
</tr>
</tbody>
</table>


3. RESULTS AND DISCUSSION

Demographic Characteristics of Children

Table 2: Distribution of respondents by age

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-6 months</td>
<td>12</td>
<td>5.0</td>
</tr>
<tr>
<td>7months - 1 year</td>
<td>86</td>
<td>35.8</td>
</tr>
<tr>
<td>2 - 5 years</td>
<td>142</td>
<td>59.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>240</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


Table 2 shows the age distribution of sampled children in the study area. The result shows that majority (59.2%) of the children (respondents) aged between 2 and 5 years of age, 35.8 percent were between 7months and 1 year of age while 5.0 percent were between 1 and 6 months old. The result implies that all the categories of children between the 1 month old and five years of age were captured in this survey.
Table 2: Distribution of respondents by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>112</td>
<td>46.7</td>
</tr>
<tr>
<td>Female</td>
<td>128</td>
<td>53.3</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>


Table 2 presents sex distribution of sampled children in the study area. The result reveals that more than half (53.3%) of the respondents were female while 46.7 percent were male. This implies that both genders of the children in the study area were captured in the survey.

Table 3: Distribution of respondents by number of children in the household

<table>
<thead>
<tr>
<th>Number of children</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3</td>
<td>156</td>
<td>65.0</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
<td>16.7</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>8.3</td>
</tr>
<tr>
<td>5 and above</td>
<td>20</td>
<td>8.3</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>


As contained in Table 3, majority (65.0%) of the household under study had less than 3 children in the home. Also, 16.7 percent had 3 children in the household, 8.3 percent had 4 and above 5 children respectively. This implies that children in all the sampled households were sizeable in number and can easily be studied.

Table 4: Distribution of respondents by main occupation of parents

<table>
<thead>
<tr>
<th>Occupation of parent</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trading</td>
<td>56</td>
<td>23.3</td>
</tr>
<tr>
<td>Artisanship</td>
<td>66</td>
<td>27.5</td>
</tr>
<tr>
<td>Civil servant</td>
<td>64</td>
<td>26.7</td>
</tr>
<tr>
<td>Farmer</td>
<td>26</td>
<td>10.8</td>
</tr>
<tr>
<td>Others</td>
<td>28</td>
<td>11.7</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>


Table 4 presents distribution of respondents by parents’ main occupation. The result shows that 23.3 percent of the parents were traders, 27.5 percent were artisans who one work or the other they have been trained in capable of providing livelihood for the family, 26.7 percent were civil servant, 10.8 percent were farmers while 11.7 percent belong to other form of occupation apart from those listed above. The implication of this is that all (100.0%) the parents captured in the survey were not lazy and indolent as they all had one occupation or the other they engaged in to make ends meet.

4.2 What are the anthropometric indices of children under five (5) years old?

Table 5: Distribution of respondents by height (cm)

<table>
<thead>
<tr>
<th>Height</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>8</td>
<td>3.3</td>
</tr>
<tr>
<td>20-49</td>
<td>8</td>
<td>3.3</td>
</tr>
<tr>
<td>50-79</td>
<td>86</td>
<td>35.8</td>
</tr>
<tr>
<td>80 and above</td>
<td>138</td>
<td>57.5</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>


Table 7 presents distribution of respondents by height and this is measured in centimeters (cm). The result revealed that majority (57.5%) of the respondents had heights between 80cm and above. Also, 35.8 percent had heights between 50 and 79cm, while 3.3 percent had heights between less than 20cm and 20-49cm respectively. The findings imply that majority (57.5%) had higher heights compared to their other counterparts.
Table 6: Distribution of respondents by weight (kg)

<table>
<thead>
<tr>
<th>Weight</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>80</td>
<td>33.3</td>
</tr>
<tr>
<td>10-15</td>
<td>144</td>
<td>60.0</td>
</tr>
<tr>
<td>16 above</td>
<td>16</td>
<td>6.7</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Source: Field Survey, 2019.*

Table 6 shows that majority (60.0%) weighed between 10-15kg, 33.3 percent weighed less than 10kg while 6.7 percent weighed between 16kg and above. The result implies that respondents had weights that are commensurate with their ages and heights. This could be as a result of the fact that children were averagely being fed with balanced diets that will improved their body performance and help in weight increase.

Table 7: Distribution of respondents by nutritional status

<table>
<thead>
<tr>
<th>Nutritional status</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>24</td>
<td>10.0</td>
</tr>
<tr>
<td>Moderate</td>
<td>30</td>
<td>12.5</td>
</tr>
<tr>
<td>Mild</td>
<td>134</td>
<td>55.8</td>
</tr>
<tr>
<td>Normal</td>
<td>52</td>
<td>21.7</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
<tr>
<td>Stunted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>16</td>
<td>6.7</td>
</tr>
<tr>
<td>Moderate</td>
<td>44</td>
<td>18.3</td>
</tr>
<tr>
<td>Mild</td>
<td>30</td>
<td>12.5</td>
</tr>
<tr>
<td>Normal</td>
<td>150</td>
<td>62.5</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
<tr>
<td>Wasted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>34</td>
<td>14.2</td>
</tr>
<tr>
<td>Moderate</td>
<td>66</td>
<td>27.5</td>
</tr>
<tr>
<td>Mild</td>
<td>16</td>
<td>6.7</td>
</tr>
<tr>
<td>Normal</td>
<td>124</td>
<td>51.7</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Source: Field Survey, 2019*

Table 7 presents frequency distribution of respondents by their nutritional status. This has been classified according to anthropometric standard into underweight, stunted and wasted parameters. The findings revealed that 55.8 percent of the respondents were mildly underweight, 62.5 percent had normal stunted growths while 51.7 percent had normal wasted growth. This result is in line with the anthropometric standard of measuring nutritional status in children.

Table 8: Nutritional Knowledge level of mothers of children under five (5) years

<table>
<thead>
<tr>
<th>Level of nutritional knowledge of the mother</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High nutritional knowledge</td>
<td>138</td>
<td>57.5</td>
</tr>
<tr>
<td>Low nutritional knowledge</td>
<td>102</td>
<td>42.5</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Source: Field Survey, 2019*

From the result of the analysis above, it indicated that majority of the mothers of under five children (57.5%) in the study area have high nutritional knowledge of their under five children while 43.5% had low nutritional knowledge of their under five children.

Summary of major findings

The findings revealed that majority (59.2%) of the children (respondents) aged between 2 and 5 years of age. More than half (53.3%) of the respondents were female. The result also shows that 23.3 percent of the parents were traders, 27.5 percent were artisans who one work or the other they have been trained in capable of providing livelihood for the family, 26.7 percent were civil servant, 10.8 percent were farmers while 11.7 percent belong to other form of occupation.
The findings showed the anthropometric measurement of children in which height of respondents ranged between 80cm and above (57.5%), the weight of respondents ranged between 10-15kg (60.0%). In addition, findings revealed that 55.8 percent of the respondents were mildly underweight, 62.5 percent had normal stunted growths while 51.7 percent had normal wasted growth. This result is in line with the anthropometric standard of measuring nutritional status in children.

Distribution of respondents by food consumption in the last 24 hours showed that 53.3 percent of the respondents consumed rice for breakfast, 83.3 percent indicated rice as part meal for lunch while 95.5 percent indicated they consumed rice as part meal for dinner. This implies that rice as food is highly consumed among respondents in the study area. The result also shows that 98.3 percent consumed vegetable oil as breakfast, 96.7 percent consumed palm oil for breakfast, 72.5 consumed salt, 98.3 percent consumed water while 53.3 percent consumed soft drink as breakfast. The result implies that respondents consumed different varieties of food as breakfast in the study area. Findings also revealed that 98.3 percent consumed water as full meal for lunch. The results indicated that there was adequate maternal nutritional knowledge of the parents in relation to the nutrition of their children.

4. CONCLUSION AND RECOMMENDATIONS

Findings from this study provided data which reflects the nutritional status of the under-five and this would help in decision or policy making process. This study would help in early recognition of nutritional related problems of the under-five which would allow the mothers of children with good nutritional status to be praised and mothers with children with poor nutritional status to be adequately counseled.

This study has shown that the food intake of children under the age of five (5) in the study area should be monitored because it has a long way to go about the nutritional status of children which is a determinant factor for their well-being. Children should be given meals that contain all classes of food nutrients in order to prevent the incidence of malnutrition, underweight, stunted growth and wasted growth. Proper food intake has impact on the cognitive and academic abilities.

Therefore, the food intake of children has effect on the height and weight of children. Therefore, the following recommendations are suggested:

i) Children should always be given balanced diet so as to enhance their general well being.

ii) Children should take food at the appropriate time to improve their body mass index.

iii) Parents/guardians should supplement the food intake of children to improve their Nutritional status.

iv) When appropriate, health practitioners who work with children should encourage the parents on proper feeding for their children.

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PREVALENCE OF INTESTINAL PARASITES AMONG PRIMARY SCHOOL CHILDREN IN ILARO, YEWA SOUTH LOCAL GOVERNMENT AREA, OGUN STATE

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Abstract

Intestinal parasitic infections are common public health problems among school age children in Nigeria. This study assessed the prevalence of intestinal parasites among primary school children aged 6-12 years in Yewa South Local Government Area, Ogun State. Three hundred and fifty six (356) respondents were selected using stratified sampling technique. A structured questionnaire was used to obtain information on socio-demographic characteristic of the respondents. Stool samples were analyzed for intestinal parasites using cellophane thick smear method. Personal hygiene of the children and sanitation condition of their schools were also assessed using on site observation checklists. Data obtained were analyzed using descriptive statistics while Pearson Product Moment Correlation (PPMC) was used to establish relationship among variables. Result showed that females were 50.6% while males were 49.4%. Prevalence of intestinal parasites was 10.2% for Ascaris lumbricoide, 4.2% for hookworm, 0.6% for Hymenolepis nana, 1.8% for Trichuris trichiuria, 0.6% for Schistosoma mansoni and 0.6% for Strongyloides stercoralis. Personal hygiene condition revealed that 87.1% had acceptable general grooming. Majority (74.4%) washed fruits and vegetable before consumption. About 58.0% of the respondents had clean hands and nail beds. The practice of handwashing after defecation was observed by 84.6%. The study established the presence of intestinal parasite (Ascaris lumbricoide, hookworm and Trichuris trichiura) among the children in the study location. There is need for school management to collaborate with health officers on intestinal parasite control programmes.

Key words: Prevalence, Intestinal parasite, School children.

1. INTRODUCTION

Intestinal parasitic infections still constitute one of the major causes of public health problems in the world, particularly in developing countries (Ekpenyong, 2008). Intestinal parasites have been described as constituting the greatest single worldwide cause of illness and disease. Numerous studies have shown that the incidence of intestinal parasites may approach 99% in developing countries (Jon, 2010). Intestinal parasites are organisms that invade the digestive system with the potential for stealing important nutrients and harming tissue. Less common in civilized countries, intestinal parasites can enter the body by eating uncooked or unwashed foods or contacting faeces (Barbara, 2012).

Helminths or worm infestations refer to worms that live as parasites in the human body and are a fundamental cause of disease associated with health and nutrition problems beyond gastrointestinal tract disturbances (Jamaiah and Rohela, 2003). Globally, over 3.5 billion people are infected with intestinal worms, of who 1.47 billion are infected with roundworm, 1.3 billion people with hookworm and 1.05 billion with whipworm (Ekpenyong, 2008).

About 400 million school-age children around the world are infected with roundworm, whipworm and hookworm (Luong, 2003). Intestinal parasitic infections are most common among school age-children and tend to be of high intensity in age group (Sharma et al., 2004). Children are among the most vulnerable to environmental threats as they are in a dynamic state of growth with their cells multiplying fast and their organ systems developing at a rapid rate (WHO, 2003). The highest infection rate and worm burden were found among school children aged 5-15 years and were attributed to poverty, illiteracy, poor sanitary conditions, unhygienic practices, absence/ lack of access to potable water, poor housing, hot and humid tropical climate (WHO, 1991; Sehgal et al., 2010). These can affect child development; educational achievement, reproductive health, and social and economic development (Nematian, 2008).

These parasites consume nutrients from the children they infect, thus retarding their physical development. They destroy tissues and organs, cause abdominal pain, diarrhoea, intestinal obstruction, anaemia, ulcers and other...
health problems. All of the consequences of infection can slow cognitive development and thus impair learning. It produces nutritional deficiencies and anaemia in children, especially when hookworm infestation is present (Adeyeba and Akinlabi, 2002; Ahmed et al., 2003).

As children are most at risk at an age when they are both growing and learning, intestinal parasitic infections potentially threatens a child’s overall physical and psychological development and may cause or aggravate malnutrition (Stephenson et al., 2000). The study aimed at determining the prevalence of intestinal parasite and investigate the hygienic conditions as well as describe the sanitary conditions of students in the schools investigated.

2.0 MATERIALS AND METHODS

Study sites
The research was conducted in Ilaro, Yewa South Local government in Ogun State. The study was descriptive and cross sectional covering government public and approved private primary schools in Ilaro. The study was carried out in 2018/2019 academic session. There are 72 government-owned primary schools and 73 approved private primary schools in the LGA. According to record obtained from Zonal office of Ministry of Education, Science & Technology, there are 50 primary schools in Ilaro, 16 public primary schools and 34 private primary schools. Twenty percent (20%) of the total population of number of primary schools in Ilaro was used as representative which is 10 schools altogether. Sampling proportional to size was used to select the number of public and private primary school to use. Stratified random sampling methods were used to select subject for the survey. The samples for this study were drawn from both public and private primary schools within Ilaro. A structured pretested questionnaires designed in English was used to obtain information from three hundred and fifty six (356) respondents.

Personal Hygiene Practices of the School Children
The personal hygienic practices of the primary school children were assessed specifically by asking them question to obtain information on their perspectives on personal hygiene and physically rate them whether they are in good condition or not. Questions on general hygiene/grooming, cleanliness of hand and nail beds, hand washing after defecation, sharing of underwear with other sibling and washing of vegetables / fruits by the pupil himself or herself were asked.

Sanitary Conditions of Schools
The schools’ sanitary conditions were assessed specifically by using some observational sanitation spot checks measures such as: type of water supply, condition of water supply, type of toilets facility, number of toilets, adequacy of toilet for school population, usage of toilets, toilets /latrine condition of cleanliness, availability of soap for hand washing, and presence of garbage piles around the school compounds.

Examination of Faecal Sample for Ova/Egg of Intestinal Parasite
Each eligible child was asked to provide a fresh faecal sample in cleaned and dried specimen bottles provided. A specimen bottle marked with identification number, name, sex, and age of child was given to each pupil. One stool sample was collected from each pupil. Faecal samples were collected monthly for a period of four months. On collection of the faecal samples, they were taken to the laboratory for examination. Stool samples were examined within 12 hour by concentration method for eggs of intestinal parasites (Cheesebrough, 1992).

The concentration method procedure goes thus:

1. At the laboratory, a drop of fresh physiological saline was placed on a slide. Using a piece of clean stick, a small amount of faecal sample was mixed with the saline.

2. In order to concentrate the parasites in the faeces; formol-ether concentration technique was employed. Using a stick, about 1g of the faeces was mixed with physiological saline and was put in a screw-cap bottle containing 4ml of 10 % formol water.

3. The plastic was capped and mixed by shaking for about 20 seconds. Thereafter, the faeces were sieved, and the sieve suspension collected in a beaker. The suspension was then transferred to a tube and 3 ml of ether was added. The tube was stoppered and mixed by shaking for one minute. Thereafter, the stopper was removed and centrifuged immediately at 3000 rpm for one minute.
4. After centrifuging, four layers were evident; the top layer of ether, thin layer of debris, formalin, and sediment in bottom with parasites. An applicator stick was used to loose the layer of faecal debris from the side of the tube. The ether, debris and formalin were then carefully poured off.

5. The sediment was mixed, transferred to a slide and covered with a cover slip.

6. The slide was examined under the microscope using first, the 10x objective, followed by 40x objective to identify the eggs of intestinal parasites (Ash and Orihel, 2003).

The number of pupils who tested positive with intestinal parasite, and the type of intestinal parasite observed was recorded. The diagnosis of intestinal parasite was based on identification of helminth ova and protozoan cysts/egg in the faeces sample during microscopic analysis. A child was considered to have intestinal parasite(s) when ova or egg/cysts of one or more of the following under listed species of intestinal parasites were present in his or her faeces.

1. *Ascaris lumbricoides*

2. *Trichuris trichiuria*

3. *Taenia species*

4. *Hymenolepis nana*

5. *Hookworm*

6. *Gardia lamblia*

7. *Schistosoma mansoni*

8. *Strongyloides stercoralis*

3.0 RESULTS

Table 1 shows the prevalence of intestinal parasites among primary school. The results showed that 4.8% and 5.4% of the male and female children were positive to *Ascaris lumbricoides* while 1.8% only female children were positive to *Trichuris trichiuria* respectively and 0.6% of male children were positive to *Hymenolepis nana*. Also the prevalence of Hookworm was 1.8% (male) and 2.4% (female) while 0.6% of only male and 0.6% of only female were positive to *Schistosoma mansoni* and *Strongyloides stercoralis* respectively.

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td><em>Ascaris lumbricoides</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>8(4.8)</td>
<td>9(5.4)</td>
<td>17(10.20)</td>
</tr>
<tr>
<td>Negative</td>
<td>-</td>
<td>-</td>
<td>150(89.80)</td>
</tr>
<tr>
<td><em>Trichuris trichiuria</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>-</td>
<td>3(1.8)</td>
<td>3(1.8)</td>
</tr>
<tr>
<td>Negative</td>
<td>-</td>
<td>-</td>
<td>164(98.2)</td>
</tr>
<tr>
<td><em>Hymenolepis nana</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>1(0.6)</td>
<td>-</td>
<td>1(0.6)</td>
</tr>
</tbody>
</table>

Table 1: Prevalence of Intestinal Parasite among Primary School Children
Table 2 shows the intensity of prevalence of intestinal parasites among primary school children. It was observed that 4.2% of the children had high intensity of prevalence of *Ascaris lumbricoides*, 1.8% had low intensity of prevalence of *Trichuris trichiuria*, while 0.6% showed moderate intensity to *Strongyloides stercoralis* respectively.

**Table 2: Intensity of Prevalence of Intestinal Parasite among Primary School Children**

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ascaris lumbricoides</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>7</td>
<td>4.2</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>High</td>
<td>8</td>
<td>4.8</td>
</tr>
<tr>
<td><strong>Trichuris trichiuria</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>3</td>
<td>1.8</td>
</tr>
<tr>
<td>Moderate</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>High</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
The table 4 below showed the description of sanitary conditions of schools investigated: it was observed that only two private schools were having tap water supply while all of the public schools were found to have well water. Also five of the schools were having water closets (convenience) while the rest had pit latrine. Toilet facilities were not adequate for the population of nearly all the schools.

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hymenolepsis nana</strong></td>
<td>-</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Hookworm</strong></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Low</td>
<td>4</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>High</td>
<td>3</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td><strong>Schistosoma mansoni</strong></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Low</td>
<td>1</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>High</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Strongyloides Stercoralis</strong></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Low</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Moderate</td>
<td>1</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### Table 4: Description of Sanitary Conditions of Schools Investigated

<table>
<thead>
<tr>
<th>Schools</th>
<th>Sources of water supply</th>
<th>Type of toilet facility</th>
<th>Latrine lid</th>
<th>No of toilet</th>
<th>Adequacy of toilet for school population</th>
<th>Usage of toilet</th>
<th>Condition of toilets cleanliness</th>
<th>Availability of soap &amp; water for hand washing</th>
<th>Garbage piles around school premises</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Public</td>
<td>Well water</td>
<td>No toilet/latrine</td>
<td>Not applicable</td>
<td>0</td>
<td>Inadequate</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Available</td>
<td>Absent</td>
</tr>
<tr>
<td>2. Public</td>
<td>Well water</td>
<td>Pit latrine</td>
<td>Present</td>
<td>2</td>
<td>Inadequate</td>
<td>In use</td>
<td>Clean</td>
<td>Available</td>
<td>Present</td>
</tr>
<tr>
<td>3. Private</td>
<td>Tap water</td>
<td>Water Closet</td>
<td>Not applicable</td>
<td>1</td>
<td>Inadequate</td>
<td>In use</td>
<td>Clean</td>
<td>Available</td>
<td>Absent</td>
</tr>
<tr>
<td>4. Private</td>
<td>Well water</td>
<td>Water Closet</td>
<td>Not applicable</td>
<td>8</td>
<td>Adequate</td>
<td>In use</td>
<td>Clean</td>
<td>Available</td>
<td>Absent</td>
</tr>
<tr>
<td>5. Private</td>
<td>Well water</td>
<td>Pit latrine</td>
<td>Present</td>
<td>3</td>
<td>Inadequate</td>
<td>In use</td>
<td>Clean</td>
<td>Available</td>
<td>Absent</td>
</tr>
<tr>
<td>6. Private</td>
<td>Well water</td>
<td>Pit latrine</td>
<td>Present</td>
<td>2</td>
<td>Inadequate</td>
<td>In use</td>
<td>Clean</td>
<td>Available</td>
<td>Present</td>
</tr>
<tr>
<td>7. Private</td>
<td>Well water</td>
<td>Water Closet</td>
<td>Not applicable</td>
<td>4</td>
<td>Adequate</td>
<td>In use</td>
<td>Clean</td>
<td>Available</td>
<td>Absent</td>
</tr>
<tr>
<td>8. Private</td>
<td>Tap water</td>
<td>Water Closet</td>
<td>Not applicable</td>
<td>8</td>
<td>Adequate</td>
<td>In use</td>
<td>Clean</td>
<td>Available</td>
<td>Absent</td>
</tr>
<tr>
<td>9. Public</td>
<td>Well water</td>
<td>Pit latrine</td>
<td>Absent</td>
<td>4</td>
<td>Inadequate</td>
<td>Abandoned</td>
<td>Dirty</td>
<td>Unavailable</td>
<td>Present</td>
</tr>
<tr>
<td>10. Private</td>
<td>Well water</td>
<td>Water Closet</td>
<td>Not applicable</td>
<td>3</td>
<td>Inadequate</td>
<td>In use</td>
<td>Clean</td>
<td>Available</td>
<td>Absent</td>
</tr>
</tbody>
</table>

### 4.0 DISCUSSION

Intestinal parasite among primary school children in Ilaro, Yewa South local government area of Ogun state was assessed in this study. Generally, intestinal parasitic infestation abounds in developing countries with school children carrying the heaviest burden of the associated morbidity (Opara and Udoidung, 2003). Abah and Arene (2006) recorded 42.7% prevalence with hookworm 16.0%, *Ascaris lumbricoides* (15.4%), *Trichuris trichiura* (8.0%), *Strongyloides stercoralis* (3.0%), and *Taenia saginata* (1.7%) in their work on intestinal helminthiasis among primary school children in Akpor area of Port Harcourt, Rivers State. Ezenwaka et al. (2011) reported 18.5% prevalence among children in Ogbaru Local Government Area of Anambra State with...
Ascaris lumbricoides (9.5%), hookworm (7.5%), Trichuris trichuria (1.5%), Enterobius vermicularis (1%), and Taenia species (1%), while Ezeagwuna et al. (2011) reported 47% overall prevalence among school children in Umuukwu, Aram, in Anambra State in their work.

Studies conducted on the prevalence of intestinal parasites among school children in Northwest Ethiopia was in the range of 55.6% to 72% (Mengistu et al., 2010; Worku et al., 2009). The present study showed a relatively low prevalence of intestinal parasites: Ascaris lumbricoides (10.2%), Trichuris trichuria (1.8%), Hookworm (4.20%), Hymenolepis nana (0.6%), Schistosoma mansoni (0.6%), Strongyloides stercoralis (0.6%), and Taenia saginata (0.0%) comparable to the above report and report from the study conducted in Babile town, eastern Ethiopia (Tadesse, 2005). The difference could be due to variability in the prevalence of these infections, low sensitivity of the diagnostics method, the use of single stool sample and environmental contamination could partly explain the observed difference. Although the prevalence rates of individual parasites vary considerably among the primary school children, Ascaris lumbricoides, Trichuris trichuria and hookworm were found to be the most prevalent parasites in this study.

This finding was in agreement with reports of previous studies conducted in Ethiopia (Yami, 2011). The three species are cosmopolitan; Ascaris lumbricoides, Trichuris trichuria are transmitted by the faecal–oral route, while hookworms actively penetrate exposed skin. Presence of Ascaris specie and Trichuris specie indicates that food and water are contaminated with infective eggs of these parasites by any of a number of routes, or that hand to mouth transmission may occur (Ekpo et al., 2008). The reasons for this prevalence may be attributed to poor environmental conditions and personal hygiene, an inadequate supply of drinking water, and a waste disposal system which does not correspond to approved standards (Ukpai and Ugwu, 2003; Banke et al., 2006). Food and drinking water handling equipment may be contaminated if there are no safe and secured human waste disposal methods or adequate hand-washing facilities as it is the case in some public owned schools where pupils defecate around school compounds and are unable to wash their hands because there is no soap and only infrequent water (Ekpo et al., 2008).

The presence of hookworm infestation in this study may be as a result of school children who do not wear shoe when they are playing within and outside school premises as hookworm penetrates the exposed skin (UNICEF, 2001). The use of excreta as manure by peasants’ farmers might also be acting as a veritable source of infection since children and their mothers often go to the farm to tender the vegetables (Opara, 2003).

This study indicates that the prevalence of intestinal parasite was more among the female respondents. This trend might result from the fact that females are more exposed to infection because of their attachment to their mother, they tend to accompany them to their farmland or backyard farmland or to their shops where they play with soil. Also it could be due to their unconcern attitude towards hygiene, as some see adherence to hygiene practices as a burden. Garbage’s piles were accumulated around some schools and school children were seen digging and playing on them. Thus, the children may have been exposed to an additional risk for the transmission of intestinal infestation more than children from privately owned schools. Lapses in hygienic practices by few pupils, poor sanitary condition of some of the schools investigated might have contributed to the presence of intestinal parasites like Hymenolepis nana and Schistosoma mansoni (Yami, 2011).

The study observed that sanitary facilities in the public owned primary schools investigated were inadequate and this is of epidemiological significance considering the number of hours pupils spend in schools (Ibrahim, 2011). The ratio of toilets to number of students far exceeded the recommended ratio as stated by Banke et al. (2006). However, the sanitary condition of the private school was better. Garbage piles were accumulated around public owned schools and school children were seen playing very close to some of these. Thus, the children may have been exposed to the risk of intestinal infestation as pupils defecated in those garbage piles after schools hours due to inadequacy of toilets and when there was no water to clean the toilets as stated by some pupils. Provision of adequate toilet facilities that children are trained to use and are happy to use will certainly discourage indiscriminate defecation elsewhere. The provision of adequate sanitary facilities could interrupt transmission of faecal oral pathogens (Ibrahim, 2011).

The outcome of this study suggests the urgent need for provision and improvement of sanitary facilities in schools. Regularly emptied garbage cans are needed in public owned schools. Epidemiological evidence suggests that improvement of sanitation and community hygiene, along with improvements in water supply, have a considerable impact in reducing communicable diseases (Minvielle et al., 2004; Graczyk et al., 2005). The absence of drinking water in schools may drive pupils to other unhygienic sources thereby increasing the risk of communicable diseases (Ibrahim, 2011).
The spot check personal hygiene practices of the majority of the respondents, was adequate in terms of cleanliness of school uniform. This might be due to constant oral education on personal hygiene, its importance to an individual health and regular checking of pupils’ neatness culture which is practiced in all schools. Also, the hygiene practices in terms of washing of fruits and vegetables and handwashing after defecation were quite impressive for all respondents from public and privately owned schools. This may be due to the fact that bowl for water and soap were conspicuously placed in locations where pupils could easily assess them on their way to and back from the toilets. Hands are vectors that can transport disease agents from person to person directly or indirectly via surfaces. Hands that have been in contact with faeces, nasal excretions and other bodily fluids, and not subsequently adequately washed, can vehicle large numbers of viruses, bacteria and possibly other parasites (Bloomfield and Scott, 2003). Many pupils shared underwear with their siblings in which was of epidemiological significance in terms of health as there could be transfer of parasite invasion from a carrier within the siblings of respondents to another and this may constitute a health hazard.

The prevalence of these intestinal parasites among the school children is of great concern. Hookworm is known to cause systemic secondary effects related to iron deficiency, anaemia and therefore inducing malnutrition. Ascariasis causes vitamin A and carotenes deficiencies and possibly malnutrition as secondary effects. Trichuris in the same way causes iron deficiencies, anaemia which may also lead to malnutrition (Amuta et al., 2004).

5.0 CONCLUSIONS AND RECOMMENDATION

Ascaris lumbricoides, Hookworm and Trichuri trichuria were the three major intestinal parasites identified among the children. The observed personal hygienic practices of respondents were high, while the sanitation conditions of some schools investigated were poor. The study established the presence of intestinal parasite (Ascaris lumbricoides, hookworm and Trichuris trichuria) among the children in the study location. There is need for school management to collaborate with health officers on intestinal parasite control programmes.

REFERENCES


PROXIMATE COMPOSITION AND ENERGY VALUE OF CRACKER BISCUIT FROM OKARA FORTIFIED PLANTAIN-SORGHUM FLOUR BLEND

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The Federal Polytechnic, Ilaro, Ogun State, Nigeria

ABSTRACT
Biscuits were produced from composite flour of Plantain–sorghum fortified with Okara blends (100Plantain[P]:0Sorghium[S]; 75P:25S; 50P:50S; 25P:75S; 100S:0P; 95P:0S:5Okara[O]; 72.5P:22.5S:5O; 47.5P:47.5S:5O; 22.5P:72.5S:5O; 22.5P:75.5S:5O; 0P:95S:5O). The composite flour and the biscuit produced were analysed for proximate composition using standard methods. For the composite flour the moisture content ranged from 5.50 % to 7.70 %, ash 1.5 % to 2.40 %, fat 1.90 % to 2.89 %, protein 2.70 % to 6.00 %. Carbohydrate, 79.28 % to 83.80 % energy 366.2 to 368.89 kcal/100g and the biscuits’ proximate composition: moisture content 6.1 % to 8.2 %, fibre 2.7 % to 4.0 %, ash 2.8 % to 3.00 %, protein 2.9 % to 6.5 %, fat 3.20 % to 4.40 %, carbohydrate 75.1 % to 80.9 %, energy 363.3 kcal/100g to 370.5 kcal/100g Sensory evaluation of the biscuits produced were evaluated, panelists were asked to evaluate each category of sample for colour, taste, flavour, texture, aroma, after taste, and overall acceptability on a 9-point Hedonic scale, blend of 72.5P:22.5S:5O, was the most acceptable sample among all the samples used for the production of biscuit.

1.0 INTRODUCTION
Crackers are usually defined as biscuits, which are all more or less unsweetened, salty, thin and crisp and refers to products with very low sugar and fat content. In Nigeria, biscuits constitute a popular cereal food consumed by the young and the old. Some of the reasons for such wide popularity are low cost compared to other processed foods, good nutritional quality and availability in different forms, varied taste and longer self-life. (Hussein et al., 2011). They are ready to eat convenient and inexpensive food products, containing digestive and dietary principles of vital importance (Kulkarini, 1997).

Soy milk residue (okara) is a by-product in the manufacture of soymilk and tofu, and can be grouped as non-traditional soy protein food. This by-product had little or no market value and was used mainly as animal feed despite its rich nutrient content. (Kulkarini, 1997). Its disposal constituted a very big problem to soymilk cottage industries because of its bulkiness and susceptibility to yeast. However, okara contains about 27 % protein (dry basis), 10 % oil, 42 % insoluble fiber and 12% soluble fiber [O’Toole, 1999]. The okara protein has good nutritional quality and a superior protein efficiency ratio. Extensive researches have been done by Puechkamut and colleagues on utilization of okara, for example, substituting it for wheat flour to produce cookies or bread, and extracting valuable protein from okara [Puechkamut and Thiewtua, 2006; Puechkamut, 2007; Puechkamut and Phewnim, 2011; Puechkamut and Panyathitipong 2012].

Plantain is a major staple food crop in the humid and sub-humid parts of Africa and a major source of energy for millions of people in these regions. It belongs to the family Musaceae and the genus Musa. Musa paradisiaca, also known as plantain (English), ‘Ogede agbagba’ (Yoruba), ‘Ayaba’ (Hausa) and ‘Ogadejioke’ (Igbo), is a tropical plant that is native to India. In Nigeria, plantain production was estimated at about 2.11 million metric tons in 2004 of the most important crops of the tropical plants. The fruits grow in clusters, each separate plantain of the cluster being about 1 inch in diameter and somewhat longer than a banana fruit. Most plantain foods are eaten as boiled, fried or roasted. It was reported that when unripe plantain is processed into flour, it is used traditionally for the preparation of gruel, which is made by mixing the flour with appropriate quantity of boiling water to form a thick paste (Amala). Nutritionally, plantain fruit is endowed with carbohydrates, minerals, amino acids, fiber, and carotenoids. This composition makes it a good material for the formulation.
Sorghum is a major cereal in the semi-arid regions of the world where it is an important food and feed crop. Sorghum species (Sorghum vulgare and Sorghum bicolor) are members of the grass family. Sorghum is known by a variety of names: great millet and guinea corn in West Africa. In the semi-arid tropics of Africa and India the grain forms the staple diet for large populations, where nearly all the produce is used directly as human food (Sanni, et.al., 2004). The potential food and industrial applications of sorghum have been studied and reported by several authors (Doggett, 1998; Delcour, et.al., 2000). The flour was found to have higher levels of lipids, ash, crude fiber, and protein. Adeyemi and Idowu, (1990) and Dhingra and Jood, (2004), studied the effects of different flour substitutions on gruel making physical qualities which include colour, texture, taste and overall acceptance of composite flours produced from cereals and leguminous seed. It can also be malted and processed into malted foods, beverages, and beer.

Composite flour refers to the mixture of different concentrations of non-wheat flours from cereals, legumes, roots and tubers with wheat flour or can be a mixture of flours other than wheat flour. Composite flours are recently manufactured not only to improve the desired functional properties of end product based on them but also to improve nutritional composition. (Adeyemi and Ogazi, 1985; Shittu, et. al., 2007) Composite flours have been used extensively and successfully in the production of baked goods.

Over the years unripe plantain and wheat flour were recommended for regulating blood glucose due to their high fiber content and low glycaemic index. But the cost of importation associated with wheat, the need for production of functional composite flour using other readily available and inexpensive materials such as cereal and legumes (sorghum and soybean residue (okara) with good nutritional value of proteins, carbohydrates, fibers, fat and ash contents is necessary. Therefore the objective of this study is to determine the proximate composition and energy value of cracker biscuit produced from okara fortified plantain-sorghum composite flour.

2.0 MATERIALS AND METHOD

Sample Procurement

The fresh plantains, Sorghum grains, and Soya-bean used for this study were bought from Sayedero market, Ilaro in Ogun State, Nigeria.

Preparation of Plantain Flour

The green plantain fingers (20kg) were thoroughly washed with water and sun dried for 30 minutes. The fruits were then hand peeled, sliced and stored in water to avoid browning before drying. The sliced pulp was subjected to drying for 6 hours at a temperature of 80 oC using hot air oven immediately. The resultant dried pulp slices were milled with hammer mill (Bentall Superb, Model 200L 09) and sieved through a 75 μm mesh sieve and stored in airtight plastic containers at room temperature (28±2 °C) for further use.

Preparation of Sorghum Flour

Sorghum grains (5 kg) were screened of foreign bodies, washed with clean water and subjected to drying in an open air for 4 hours. The cleaned dried grains were milled with hammer mill (Bentall Superb Model 200L 09) and sieved through a 75 μm mesh sieve and kept in airtight plastic containers at room temperature (28±2 °C) for further use.

Preparation of Soybean Residue (Okara) Flour

Using Fukushima (1991) method the soybean was cleaned and washed by floatation to remove all the foreign materials, spoilt grains and debris. The cleaned beans were blanched in hot water for 25 minutes at 100 °C and dehulled. The dehulled cotyledons were washed with hot (100 °C) water twice and wet milled using 5.0 litres of water to 1 kg of beans. The slurry obtained was mixed and filtered through a muslin cloth to remove the milk and recover the residue called okara. The fresh okara was dried using hot-air oven at a temperature of 70 °C, milled and sieved through a 75 μm mesh sieve and stored in airtight plastic containers in the refrigerator at 4 °C for further use.
Composite Flour Formulation

Table 1. Percentage Composition of plantain, sorghum and okara flour

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>PLANTAIN (%)</th>
<th>SORGHUM (%)</th>
<th>OKARA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>B</td>
<td>75</td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td>C</td>
<td>50</td>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td>D</td>
<td>25</td>
<td>75</td>
<td>-</td>
</tr>
<tr>
<td>E</td>
<td>-</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>F</td>
<td>95</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>G</td>
<td>72.5</td>
<td>22.5</td>
<td>5</td>
</tr>
<tr>
<td>H</td>
<td>47.5</td>
<td>47.5</td>
<td>5</td>
</tr>
<tr>
<td>I</td>
<td>22.5</td>
<td>72.5</td>
<td>5</td>
</tr>
<tr>
<td>J</td>
<td>-</td>
<td>95</td>
<td>5</td>
</tr>
</tbody>
</table>

Production of Cracker Biscuit from the Composite Flour

The cracker biscuit was prepared by measuring 50ml of water in a bowl, into which 3.48 g of yeast was added to form a suspension, 0.16 g of baking powder was added follow by 2.02 g of salt and 100 g of the flour was added with shortening and kneaded to form dough. The dough was later cut into desired shape and baked at 170°C for 15 minutes.

Table 2. Ingredient Composition for Biscuit Production

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite flour</td>
<td>100g</td>
</tr>
<tr>
<td>Salt</td>
<td>2.02g</td>
</tr>
<tr>
<td>Fat</td>
<td>9.64g</td>
</tr>
<tr>
<td>Yeast</td>
<td>3.48g</td>
</tr>
<tr>
<td>Baking Powder</td>
<td>0.16g</td>
</tr>
<tr>
<td>Water</td>
<td>50ml</td>
</tr>
</tbody>
</table>

Chemical Analysis

The proximate composition of the composite flours analyzed using the procedure of Association of Official Analytical Chemist (AOAC, 1990), and the energy value calculated using Atwater factors (Ihekoronye and Ngoddy, 1985)

Sensory Evaluation

Sensory evaluation of the biscuit samples prepared from the plantain-sorghum fortified blends was performed using the 9 points Hedonic scale quality analysis (Iwe, 2002). Twenty (20) untrained panelists drawn from students and staff of the Federal Polytechnic, Ilaro, Ogun State, Nigeria, evaluated the biscuit samples for colour, aroma, taste, aftertaste and overall acceptability using the 9-point hedonic scale, where 1 corresponds to like extremely and 9 corresponds to dislike extremely.

Statistical Analysis

All analyses carried out in triplicate, with statistical significance established using one-way analysis of variance (ANOVA), and data reported as the mean ± standard deviation. Mean comparison and separation done using Duncan Multiple range (DMR) test at p≤ 0.05, described by the SPSS 16.0 statistical package.

3.0 RESULTS AND DISCUSSION

The moisture content of the composite flour as shown in Table 3 ranged from 5.50%-7.70% with sample E having the highest 7.70% while sample A and F having the lowest 5.50%. The moisture content of the
composite flour is significantly different ($p < 0.05$) from each other. Generally, there was an increase in moisture content as the percentage of sorghum flour substitution increases. The lower the moisture content of the product to be stored the better the shelf stability of such product. Low moisture content ensures higher shelf stability. The fortification of the composite flour with okara has positive impact on the moisture content of the composite flour. The moisture content of biscuit produced from the composite flour ranged from 6.1 % to 8.1 % (Table 4) in which sample A has the lowest value and sample I has the highest value. The fortification of the composite flour to produce biscuit with okara has positive impact on the fibre content. It was observed in this study that the moisture content of biscuit produced from composite is higher than the moisture content of wheat biscuit produced by Ajibola, et. Al. (2015), recorded to be 3.65%, and this could be as a result of high moisture content in sorghum which was fortified with Okara.

The ash content of composite flour ranged from 1.5 % to 2.40 % in which the highest was recorded in sample F and the lowest is sample E. The ash content of the composite flour F is greater than that of the wheat flour recorded to be 2.0% (Nneka et.al., 2016). Ash content indicate a rough estimation of minerals content of product, sample F has the highest ash content of 2.40 % which show that sample F has the highest mineral content. The ash content of the composite flour is significantly different ($p < 0.05$) from each other. The ash content of biscuit produced by the composite flour ranged from 2.8 % to 3.0 % in which sample D, E, H, J has the lowest value, 2.8 % and samples A and F has the highest value 3.0 %. The fortification of the composite flour to produce biscuit with okara has no impact on the ash content. The ash content of biscuit produced from composite flour in this study is higher, compared to wheat biscuit produced by Ajibola et., al., (2015) to be 2.31 %.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Moisture</th>
<th>Ash</th>
<th>Fat</th>
<th>Protein</th>
<th>Fibre</th>
<th>Carbohydrates</th>
<th>Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5.50±0.02</td>
<td>2.30±0.06</td>
<td>1.90±0.08</td>
<td>2.70±0.06</td>
<td>3.80±0.16</td>
<td>83.80±0.02</td>
<td>363.00±0.09</td>
</tr>
<tr>
<td>B</td>
<td>6.00±0.09</td>
<td>2.00±0.08</td>
<td>2.10±0.05</td>
<td>2.87±0.28</td>
<td>3.30±0.15</td>
<td>83.40±0.05</td>
<td>365.30±0.07</td>
</tr>
<tr>
<td>C</td>
<td>6.40±0.06</td>
<td>1.80±0.05</td>
<td>2.20±0.06</td>
<td>3.90±0.05</td>
<td>3.00±0.11</td>
<td>82.70±0.06</td>
<td>363.50±0.04</td>
</tr>
<tr>
<td>D</td>
<td>6.80±0.08</td>
<td>1.60±0.02</td>
<td>2.20±0.14</td>
<td>4.40±0.08</td>
<td>2.80±0.02</td>
<td>82.20±0.09</td>
<td>366.20±0.20</td>
</tr>
<tr>
<td>E</td>
<td>7.70±0.03</td>
<td>1.50±0.15</td>
<td>2.30±0.12</td>
<td>5.60±0.09</td>
<td>2.50±0.07</td>
<td>80.40±0.05</td>
<td>364.70±0.09</td>
</tr>
<tr>
<td>F</td>
<td>5.50±0.05</td>
<td>2.40±0.07</td>
<td>2.45±0.09</td>
<td>3.20±0.10</td>
<td>3.90±0.03</td>
<td>82.62±0.03</td>
<td>365.05±0.04</td>
</tr>
<tr>
<td>G</td>
<td>5.80±0.10</td>
<td>2.00±0.11</td>
<td>2.62±0.07</td>
<td>4.20±0.11</td>
<td>3.60±0.04</td>
<td>81.61±0.04</td>
<td>366.18±0.04</td>
</tr>
<tr>
<td>H</td>
<td>6.40±0.12</td>
<td>1.80±0.04</td>
<td>2.71±0.02</td>
<td>4.60±0.13</td>
<td>3.40±0.09</td>
<td>81.06±0.12</td>
<td>367.15±0.07</td>
</tr>
<tr>
<td>I</td>
<td>6.80±0.04</td>
<td>1.70±0.13</td>
<td>2.81±0.06</td>
<td>5.70±0.15</td>
<td>3.20±0.05</td>
<td>80.20±0.11</td>
<td>368.89±0.06</td>
</tr>
<tr>
<td>J</td>
<td>7.40±0.07</td>
<td>1.60±0.03</td>
<td>2.89±0.08</td>
<td>6.00±0.05</td>
<td>2.80±0.08</td>
<td>79.28±0.15</td>
<td>367.13±0.05</td>
</tr>
</tbody>
</table>

Table 3: The Proximate composition (%) and Energy (Kcal/100g) values of the Okara Fortified Plantain-Sorghum Composite Flour

<table>
<thead>
<tr>
<th>Sample</th>
<th>Moisture</th>
<th>Ash</th>
<th>Fat</th>
<th>Protein</th>
<th>Fibre</th>
<th>Carbohydrates</th>
<th>Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6.10±0.03</td>
<td>3.00±0.06</td>
<td>3.20±0.15</td>
<td>2.90±0.07</td>
<td>3.90±0.06</td>
<td>80.79±0.04</td>
<td>364.00±0.02</td>
</tr>
<tr>
<td>B</td>
<td>6.40±0.04</td>
<td>2.90±0.06</td>
<td>3.40±0.11</td>
<td>3.40±0.11</td>
<td>3.50±0.11</td>
<td>80.40±0.09</td>
<td>365.80±0.06</td>
</tr>
</tbody>
</table>

Table 4 The Proximate composition (%) and Energy (Kcal/100g) values of Biscuit prepared from Okara Fortified Plantain-Sorghum Composite Flour

1st National Conference of WITED, Ilaro Chapter
The fat content of the composite flour ranged from 1.90 % to 2.89 % in which sample A has the lowest 1.90 % and sample J has the highest 2.89 %. The fat content of the composite flour is significantly different (p < 0.05) from each other. Fasasi (2009) reported that low fat content in product would help increase the shelf life of the sample by decreasing the chance of rancidity and also contribute to low energy value of product while high fat content produce would have high energy value and promote lipid oxidation. This study shows that sample A has the lowest fat content and will also have high shelf stability and low chance of rancidity. The fortification of the composite flour with okara has positive impact on them. The fat content of biscuit produced from the composite flour ranged from 3.20 % to 4.40 % in which sample A has the lowest and sample J has the highest. The fat content of biscuit from composite flour is significantly different (p < 0.05) from each other, and lower than that of biscuit produce from wheat by Ajibola et al. (2015) which was recorded to be 14.39 %. Hence the biscuits produced from the composite flour will have lower rate of rancidity to that of biscuit produced from wheat. The fortification of the composite flour to produce biscuit with okara has positive impact on the fat content of the biscuit produced.

The protein content of the composite flour varied significantly (p < 0.05) from each other. The protein content of the composite flour ranged from 2.70 % to 6.00 % with sample J having the highest 6.00 % while sample A had the lowest 2.70 %. The fortification of the composite flour with Okara has positive impact on the flour. It was observed that there was increase in protein content as the level of sorghum percentage was increased which may be attributed to the high level of sorghum in this study which is also similar to that of Okoye et al. (2016) that reported 6.84 %. The protein content of the composite flour is lower than that of wheat which was recorded by Nneka, et al (2016) to be 10.12 %. The protein content of the biscuit produced from the composite flour ranged from 2.9 % to 6.5 % in which sample A has the lowest and sample J has the highest. The protein content of the composite is significantly different (p < 0.05) from each other. It was observed in this study that there was increase in protein content of biscuit than the protein content of composite flour which could be as a result of the ingredient use in the process. The protein content of biscuit produce in this study was observed to be lower than that of biscuit produce from wheat of Ajibola et al (2015) recorded to be 10.99.

The fibre content of the composite flour varied significantly (p < 0.05) from each other. The fibre content of the composite flour ranged from 2.50 % to 3.90 % in which the highest is sample F and the lowest is sample E. The highest value of sample F could be as a result of high fibre content in plantain and okara. A research work by Kabari and Giami (2015) recorded that plantain is a good source of fibre which if mixed with Okara will surely improve the fibre content. The fibre content of sample F is greater than fibre content of Nneka, et al (2016) which is recorded to be 2.11 %. The fibre content of biscuit produced from the composite flour ranged from 2.0 % to 4.0 % in which sample F has the highest value and sample E has the lowest value. The fibre content of the composite flour is significantly different (p < 0.05) from each other. It was observed in this study that the fibre content of biscuit produced by the composite flour is higher to the moisture content of wheat biscuit produced by Ajibola, et al (2015) to be 2.45 %; biscuit produce from composite flour of sample F was recorded to have high crude fibre of 4.0 % which will have significant importance on the digestive system. The fortification of the composite flour to produce biscuit with Okara has positive impact on the fibre content.

The carbohydrate content of the composite flour is significantly different (p < 0.05) from each other. The carbohydrate content of the composite flour ranged from 79.28 % to 83.80 % in which sample A has the highest value of sample F could be as a result of high carbohydrate content in plantain and okara.
value and sample J has the lowest value. The carbohydrate value of the composite flour in this study is higher than the value of wheat recorded by Nneka, et al (2016) to be 76.30 %. The carbohydrate content of biscuit produced from the composite flour ranged from 75.1 % to 80.9 % in which highest sample A with 80.9 % and lowest value 75.1 %. The fortification of the composite flour to produce biscuit with Okara has negative impact on the carbohydrate content. The carbohydrate content of the composite flour is significantly different (p < 0.05) from each other.

The energy value of the composite flour ranged from 366.2±.20 kcal/100g to 368.89±.20 kcal/100g in which sample A has the lowest value and sample I has the highest value. The energy value of the composite flour is significantly different (p < 0.05) from each other. The fortification of the composite flour with Okara has positive impact on the flour. The energy value of in this study is lower than that of Nneka, et al (2016) which was recorded to be 382.64 kcal/100g. The energy content of biscuit produced from the composite flour ranged from 363.3 kcal/100g to 370.5 kcal/100g in which sample D has the highest value, 370.5 kcal/100g and the lowest value sample H, 363.3 kcal/100g. The energy value of the biscuit produced from the composite flour is similar to that of Okoye et al. et al (2016)

Sensory Evaluation

Table 5: Mean score of sensory evaluation of biscuit from okara-fortified plantain-sorghum composite flour

<table>
<thead>
<tr>
<th></th>
<th>COLOUR</th>
<th>TEXTURE</th>
<th>AROMA</th>
<th>TASTE</th>
<th>AFTER TASTE</th>
<th>OVERALL ACCEPTABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3.55±0.31abc</td>
<td>3.55±0.28c</td>
<td>1.40±0.11</td>
<td>3.15±0.46</td>
<td>3.45±0.53</td>
<td>3.60±0.21</td>
</tr>
<tr>
<td>B</td>
<td>4.00±0.28bc</td>
<td>3.55±0.52b</td>
<td>4.00±0.49</td>
<td>3.80±0.48</td>
<td>4.05±0.39</td>
<td>4.50±0.41</td>
</tr>
<tr>
<td>C</td>
<td>4.60±0.23c</td>
<td>6.35±0.62c</td>
<td>4.95±0.43</td>
<td>3.25±0.24</td>
<td>3.60±0.35</td>
<td>4.90±0.34</td>
</tr>
<tr>
<td>D</td>
<td>4.05±0.52bc</td>
<td>6.95±0.40d</td>
<td>5.15±0.52</td>
<td>4.05±0.21</td>
<td>3.85±0.35</td>
<td>5.10±0.39</td>
</tr>
<tr>
<td>E</td>
<td>4.45±0.27bc</td>
<td>5.45±0.17bc</td>
<td>2.90±0.48</td>
<td>5.10±0.34</td>
<td>4.90±0.59</td>
<td>5.00±0.34</td>
</tr>
<tr>
<td>F</td>
<td>3.20±0.34abc</td>
<td>5.10±0.55c</td>
<td>3.50±0.34</td>
<td>4.00±0.42</td>
<td>3.90±0.37</td>
<td>5.00±0.36</td>
</tr>
<tr>
<td>G</td>
<td>3.95±0.38bc</td>
<td>4.90±0.38c</td>
<td>3.30±0.33</td>
<td>4.05±0.03</td>
<td>3.75±0.50</td>
<td>5.20±0.33</td>
</tr>
<tr>
<td>H</td>
<td>4.20±0.32bc</td>
<td>5.15±0.48bc</td>
<td>3.20±0.32</td>
<td>3.20±0.19</td>
<td>3.75±0.46</td>
<td>4.70±0.37</td>
</tr>
<tr>
<td>I</td>
<td>3.25±0.32abc</td>
<td>5.85±0.43c</td>
<td>3.60±0.44</td>
<td>3.60±0.40</td>
<td>4.15±0.44</td>
<td>4.05±0.29</td>
</tr>
<tr>
<td>J</td>
<td>2.75±0.31abc</td>
<td>4.95±0.51c</td>
<td>3.55±0.38</td>
<td>3.55±0.44</td>
<td>3.50±0.48</td>
<td>4.95±0.31</td>
</tr>
</tbody>
</table>

The sensory scores of the biscuit produce from okara fortified plantain-sorghum composite flour revealed various significant difference in all the parameters Evaluated. All the samples were equally rated by panellist in terms of colour, sample C (50 % plantain +50 % sorghum without okara substitution) is the most acceptable with mean values of 4.60 and sample J (95 % sorghum + 5 % okara), and F(95 % plantain + 5 % okara) are partially acceptable with mean values of 2.75 and 3.20 respectively, however, samples substituted with quantity of sorghum flour were significantly different from sample A in terms of colour. The most acceptable sample in terms of texture is sample D (25 % plantain + 75 % sorghum) with mean value of 6.95 this could be due to the composition of sorghum flour in the substitution. Also sample D (25 % plantain + 75 % sorghum) is the most acceptable sample by the panellist in terms of aroma with mean value of 5.15. The taste of the biscuit is best with sample E (100 % Sorghum) according to the panellist and this has mean value of 5.10,also,sample (100 % Sorghum) has the most acceptable after taste with the mean value of 4.90. In terms of overall acceptability, sample G (72.5 % Plantain + 22.5 % sorghum + 5 % okara) was the mostly acceptable. Thus, composite flour produced of sample G could be used to produce organoleptically acceptable products and can be used for the production of cracker biscuit for everyone especially the diabetic patients.

4.0 CONCLUSION

The composite flour of plantain-sorghum fortified with Okara in this study was found to be highly nutritionally superior in terms of protein, crude fibre and fat compared to wheat flour. The fortification of the sorghum with 5 % Okara show notable increase in protein content. The fortification of plantain with 5 % okara in notable increase in fibre content compared to that of the control. The result obtained from this result shows that highly

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nutritious food/flour can be produced from plantain-sorghum composite fortified with Okara which also indicates that the composite flour could serve as the best alternative flour to substitute wheat flour. And also, production of products from this can be used to fight protein malnutrition in the developing countries.

REFERENCES


IMPACT OF SMALL AND MEDIUM ENTERPRISES ON THE GROWTH OF NIGERIAN ECONOMY

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ABSTRACT
This study investigated the impact of small and medium scale enterprises (SMEs) as the operators have being considered as main sustenance of the economy because of their capacity in enhancing the economy productivity and standard of living of the common man, as they account for over 50% of GDP of developing economies. The main objective of the work is to examine the contributions of SMEs on the growth of Nigerian economy for the period of 35 years between 1981-2015. This study adopted ex-post-facto research design and ordinary least square (OLS) method of estimation for data analysis. The data used for this analysis were generated from Central Bank of Nigeria (CBN) statistical Bulletin and Nigeria Bureau of statistics records. Stationary test was conducted on the series (data) and it was discovered that it consisted of unit root which was eliminated at first difference. Subsequently, a trend analysis and regression analysis were conducted. The result revealed that there was a positive significant relationship between SMEs and economic growth. It was also revealed that over 99% of variation in economic growth was accounted for by SMEs activities in the country. Based on the findings was conducted that SMEs are essential for rapid and sustainable economic growth and development; and in line with this it was recommended that Government should provide enabling environment for SMEs to thrive and provide assessable fund for SMEs.

Keywords: Small and Medium Scale, Economy, Growth, Job creation

1.0 INTRODUCTION
The contributions of Small Scale business to development of any economy have been widely recognized because of their capacity in enhancing industrial output and human welfare. Small scale enterprise consists of the driving force of industrial growth and development of the economy by diversification and growth of industrial production and the achievement of the basic objectives developments. Small businesses account for a greater percentage of all businesses virtually every economy and generate the majority of private sector employment and output. The small scale business also generates employment opportunities thereby reducing the rate of unemployment in the country. In recent time, small scale industrial sector is considered to be the backbone of modern day economy currently in Nigeria, small scale industries represent about 90% of the industrial (Etebefia & Kinkumi, 2013).

Numerous studies have shown that small and medium scale enterprise act as a catalyst for the growth and development of a national economy (Anthony & Arthur, 2008; Chinweuba & Sunday & Vijayakumar, 2013).

In Nigeria, governments formulate policies aimed at facilitating and empowering the growth and development of the small scale enterprises due to their contribution to the Nigeria economy like alleviating poverty, employment generation, enhance human development, and improve social welfare of the people. Therefore, the only avenue to alleviate poverty in a sustainable way is to advance economic growth and development via the creation of employment and wealth. In some developing countries, small scale business enterprises are the center source of income, a breeding ground for entrepreneurs and a provider of employment UNIDO report (2003) as cited in Kehinde, Abiodu, Adegbuye and Oladimeji (2016).

The aim of any economy (either industrialized or not) depends largely on how well managed the small scale industries are, for example, if we take a look at the standard practice of small scale industries in economically developed countries like United Kingdom or United State of America, it can be observed that they depend largely on small scale industries to reach out to the people (Etebefia & Kinkumi, 2013). There is no specific
criterion for classifying business enterprise as a small or medium or large globally. In a study carried out by the international labour organization (ILO, 2005) over 50 definitions were identified by 50 different countries for small scale industries. However, in defining small scale industries, references are usually made to quantitative measures such as number of people employed by the enterprise, investment outlay, the annual sales turnover (sales) and the asset value of the enterprise or combination of these measures.

Nevertheless, despite the efforts and contributions of past and present government towards promoting Nigeria, the contribution of this sector to the economy still remain relatively small in terms of its impact on gross domestic product (GDP), unemployment and poverty reduction. The rate of unemployment in this country is still high and majority of the population still live in poverty (Ekezie, 1995; Bacdom, 2004; Iromaka, 2006).

In the light of the above, this paper attempt to examine the impact of SMEs on the economic development of Nigeria, the research embarked on the analysis of SME in Nigeria, between the year 1981 and 2015.

The primary objective of this study is to ascertain the impact of small scale enterprise on the growth of Nigerian economy. The specific objectives include;

a) To examine the trend of Small and Medium Enterprises (SMEs) and GDP in Nigeria national development.
b) To determine the relationship between SMEs and growth in Nigeria
c) To determine the extent to which SMEs has impacted on economic growth in Nigeria

The scope of this study is to focuses on the contributions of small and medium scale enterprises to the economic growth in Nigeria. The study covers a period of 35 years from 1981 – 2016 using data extracted from Central Bank of Nigeria and Bureau of Statistics.

1.1 Research Questions

For this study to accomplish the desired objectives, some basic research questions which reflected on the objectives of the study fielded.

a) What is the trend for SMEs Performance and Economic Growth in Nigeria?
b) What is the relationship between SMEs and Economic Growth in Nigeria?
c) To what extent does SMEs Performance contribute to Economic Growth?

1.2 Research Hypotheses

H01: There is no significant relationship between SMEs and Economic Growth.

H02: There is no significant contribution of SMEs to the prediction of Economic Growth.

2.0 LITERATURE REVIEW

When statistical definitions are used based on selected quantitative criteria to define the SMEs, such definitions are inadequate to unfold the various qualitative features of these enterprises because all such quantitative indicators suffer from various shortcomings and fall short of being adequately satisfactory measures of enterprise size. As such, they are incapable of describing the important economic, social, psychological, behavioural and organizational characteristics of the SMEs which play important roles in explaining why and how small businesses emerge, develop and continue to sustain (Ahmed, 2016).

For instance, USAID in its definition of SMEs classified thus: micro enterprise as informal businesses employing five or fewer workers including unpaid family labour; small enterprises as those operating in the formal sector with five to twenty employees; and medium enterprises as those employing 21 to 50 employees (Kayanula & Quarrey, 1999).

The 1975 companies Act in the United Kingdom stated that an enterprise with a turnover of less than £ 1.4 million was small, those with turnover between £1.4 and £5.7million were medium, while those enterprises having turnover above £5.7 million were large. It also went further to classify the enterprises based on number of employees – those with fewer than 50 workers being small, between 50 and 250 workers being medium and those employing above 250 workers were described as being large. Similarly, the European Union (EU) in 1995, defined SME as any enterprise employing less than 250 employees, and went further to break down the SME
into micro (less than 10 employees, small (from 10 to 49 employees) and medium (between 50 to 249 employees) (Etuk, Etuk & Baghebo, 2014).

In Nigeria, the Central Bank of Nigeria (CBN) in its monetary policy circular No 22 of 1988 defined small-scale enterprises as having an annual turnover not exceeding five hundred thousand naira (Ali 2003). While the Federal Ministry of Industries (1973) defined small scale enterprises as businesses that have total capital (land, building machinery equipment and working capital) of up to N60,000 and employ up to 50 persons. Also, the Central bank of Nigeria in its 1990 credit Guidelines for financial institutions characterized small-scale enterprises as those whose yearly turnover does not exceed N200,000,000 or capital use does not exceed N200,000,000. Nonetheless, the CBN act 2001 placed the level of employment by small scale enterprises of less than 50 and medium scale enterprises of less than 100 labour forces. In term of the asset based; small scale has capital of less than N1 million while medium scale has less than N150 million (IFC 2002 referred to in Ogboru 2007). The SMIEIS characterized MSME as any business undertaking with a most extreme capital base of N200 million barring land and working capital and with the amount of workers at the very least 10 or more than 300. Small business was defined by the third National development plan (1975-1980) as a firm that is capable of providing employment to not more than ten employees (Taiwo, Ayodeji & Yusuf, 2012). However, MSMEs also refer to SMEs as a business with a fixed asset and working capital of an amount not exceeding N60,000 and capable of employing 50 workers. Companies and allied matters act 1990, Federal ministry of Industry Nigeria cited in Taiwo, Ayodeji & Yusuf, 2012). Defined SMEs as a firm with an annual turnover worth N2 million and a net asset of an amount not exceeding N1 million.

However, with the introduction of National Policy on MSMEs has addressed the issue of definition in respect to what constitutes micro, small and medium enterprises was addressed. The definition receives a grouping focused around double criteria, assets and employment (with the exception of land and buildings. Thus: Micro enterprises are those businesses capable of providing employment less than ten (10) employees and have an asset of less than N5 Million with the exception of land and building. Small enterprises are those businesses capable of employing 10 to 49 employees and have an asset of an amount equal to N5 million to N49.9 million with the exception of land and building. Medium enterprises are those businesses capable of employing 50 to 199 employees and have an asset of an amount equal to N50 million to N499.9 million with the exception of land and building (Yahaya, Geidam & Usman, 2016).

The National Council on Industry (NCI) at their 13th meeting held in Makurdi in July, 2001 modified the definition of small-scale business to refer to an enterprise with total capital which excludes cost of land not more than N1.5 million with labour size of not more than ten (10) employees. This includes cottage and micro industries which are mostly single family operated businesses with no employees other than the owners. Alabar, (2002) explains that any establishment employing less than ten people and whose investment in machinery and equipment does not exceed N600,000.00 is referred to as small-scale business. He further stated that such business must have fixed assets above N1 million but not exceeding N10 million excluding land (Esiebugie, Hembadoon & Loveday, 2016).

It is also worthy of note that the disparities associated with the definition of this concept could be ascribed to the differences in the background of the researchers, changes in economic conditions, institutional changes and advances in technology (Esiebugie, Hembadoon & Loveday, 2016).

2.1 Features of SMES

There are important qualitative and operational features which distinguish the SMEs from their large counterparts and also exhibit their intrinsic strengths and weaknesses. These features according to (Ahmed, 2016) include: One, a dominant organizational feature of the SMEs is that they are owned and managed by a single individual or a group of persons. Two, is a strong link between the enterprise and the entrepreneur which is inseparable in most cases from each other. While this exposes them to greater risks at times, the deep personal attention of the entrepreneur makes him strongly committed to the success of businesses. This characterizes small firms with positive (a cordial work atmosphere) as well as problematic (generational succession issue) consequences. The dominant presence of the owner-manager in all spheres of business facilitates quick and flexible decision-making, but involves a lack of delegation of authority which makes him despotic or a ‘loner’ at times; in contrast to a formal hierarchy of management style practiced by the large firms, there is hardly any division of managerial functions in the SMEs due to the absence of middle management for a key role. Due to scale barriers, policy biases and institutional rigidities has restricted access to institutional credit. High barriers
to entry into formal credit markets at affordable costs make them suffer from cash-flow problems that are more sensitive to recession from the liquidity point of view.

Generally, such businesses are characterized by labour intensive mode of production, flexible operation as they adjust quickly to various factors, use indigenous raw materials, localized operations, low gestation period, and low level of education/skills (Ifechukwu, 2000; Ali 2003)

2.2 Classification of SMES

SMES are extremely heterogeneous entities. They can be identified in a wide array of business activities, i.e. a single artisan working in a village market, the coffee shop at the corner, the internet cafe in a small town, a sophisticated engineering or software firm selling in the overseas markets, and a medium-sized parts and components manufacturer selling to the multinational automaker etc. These points to the fact that within the traditional "general category of small firms", there exists a plurality of small firms which are identified by Tommaso and Dubbini (2000) as the following: Rural firms operating in the context of a regional economy, Urban firms cross-cutting formal and informal sectors, Small independent firms operating in isolation and serving local markets, Sub-suppliers operating under indirect control of large firms, Highly specialized firms, and Firms operating directly in the international markets offering niche product.

2.3 Economic importance of SMES

Small-scale enterprise development reduces poverty through employment generation, income earning, consequent accumulated savings, and increased investment expenditure. The performance of new and existing SMES has contributed to increased economic activity, job opportunities and poverty reduction (Sirajo & Zayyanu 2014). According to Lingesiya 2012 SMES plays an important role in economic development through creation of employment opportunities, the mobilization of domestic savings, poverty alleviation, income distribution regional development training of workers and entrepreneurs’ creation of economic environment in which large firms flourish and contribute to export earnings.

2.3 Non-Economic importance of SMES

An important issue that needs to be added at this point is that over and above economic importance of the SMES, they perform important normative functions by providing economic opportunities not only generally, but especially to marginal groups such as women, ethnic minorities, the young and the elderly. It is also argued that working in SMES engenders personal values that are related not only to economic activities, but also to non-economic normative values, such as independence and self-reliance.

2.4 Challenges of SMES in Nigeria

Some of the major challenges of small enterprises in Nigeria low capacity building, this is because most of the people engaging in SMES are not well trained and skilled; secondly people misconception on limited access to capital (they believe that accessing capital is a very serious problem) government assistance is usually political and handled by corrupt official; government laudable initiated and policies to support the small scale business sectors in the state are not properly implemented; high rates of business failure low productivity; under capitalization; poor accounting standards; shortage of skill workforce and indiscipline (Sirajo et al, 2014).

Personal savings has been the major source of finance for entrepreneur in the state. This is accumulated savings earned by him as an employee elsewhere or inherited. The proprietor of the small firm may perhaps supplements his personal savings with loans from friend and relations. Government assistant programmes such as those implemented by The Industrial Development Centre (IDCs) and Federal Ministry of industry were also established to provide technical support and man power training (Sirajo et al, 2014).

2.5 Keynesian Economic Theory

Keynesian economic theory was propounded by Keynes. This theory believes that small scale enterprises play a vital role in the economic development of a country. The theory inferred that government can entrench economic stability through efficient financial disbursement to small scale enterprises drive via micro finance banks. The theory opines the operations of small scale enterprises drive the government makes the environment conductive. The government intervention in ensuring a conductive economic environment for the small scale

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enterprises must ensure efficient allocation of resources, regulation of markets, and stabilization of policies on those economic factors that interact on the operations of small scale enterprises.

Keynes assumes that small scale enterprises drive in a conductive environment where there are policies that maintain fixed interest rate, exchange rate and inflation rate that could have propulsive effect on the operations and therefore, the ability of these firms to understand its environment of operations taking cognizance of the dynamism in the business environment will not only make them pertinent decisions that enhance their performance. The following are the assumptions of the theory.

1) The theory assumes that small scale enterprises operate in environment orchestrated by the interplay of various elements of the environment. Therefore, small scale operators should take abreast of its economic environmental factors, through external to them, but help them to be proactive in their operations.

2) The theory also assumes that small scale enterprises drive in stable economic environment where there are fixed exchange rate, interest rate, inflation rate etc.

2.6 Empirical Review

Ogijiuba, Ohuche and Adenuga (2004) looked into credit availability to small and medium scale enterprises in Nigeria. The paper showed that the capitals vital for the response of bank lending to economic shocks and emphasize the need for a sound and efficient financial sector to support small and medium scale enterprise. Dada (2014) did an empirical review of commercial banks’ credit and the development of small and medium scale enterprises in Nigeria between 1992 and 2011. The estimated models shows that commercial banks to small and medium scale enterprises exert a positive influence on small and medium scale enterprise development, which was by wholesales and retailed trade output as a components of Gross Domestic Product, while exchange rate and interest rate revealed negatives effects on small and medium scale enterprises development. The study suggested among others that adequate savings should be mobilized from the public and that government should persuade banks to lend to small and medium scale enterprise by providing guarantee, interest rate concession and other incentives. Imougehele and Ismaila (2013) investigated the impact of commercial bank credit accessibility on sectoral output growth in Nigeria, covering the period 2011-2018. The result of the study revealed that commercial bank has a long run relationship with sectoral output growth in Nigeria. While appraising the growth effect of small and medium scale enterprises financing in Nigeria, Afolabi (2013) in estimating the multiple regression model. The result indicated that small and medium scale enterprises output has positive influence on economic development while lending rate is found to exert negative effect on real gross domestic product, a proxy for economic growth.

A related study by Nwosa and Oseni (2013) sought to empirically ascertain the impact of bank advances to small and medium scale enterprises on manufacturing output in Nigeria 1992-2010. The study found that banks and advances to the small and medium scale enterprises sector had significant positive impact on manufacturing output both in long-run and short-run. Akinguola (2011), in this paper, explored the relationship between small and medium scale enterprises financing and growth in Nigeria. The paper proposed that accessibility to low interest rate should be provided in other to enhance the growth in Nigeria economy. Examining the relationship between commercial bank credit indicators and rural economic growth in Nigeria, Tajudeen (2012) study shows that the rural economic growth is co-integrated with commercial bank credit indicators in Nigeria. The study also confirmed positive relationship between rural economic growth and commercial banks rural loans between commercial banks loan to agriculture and rural economic growth. Ojong, Arikpo and Ogar (2015) investigated the role of deposit money banks on the growth of small and medium scale enterprises in Nigeria. The results revealed that bank credit had a significant relationship with the growth of small and medium scale enterprises. Multiple taxations and government policies were found to have a significant relationship effect on small and medium scale enterprises growth. The authors suggested deposit money banks should be encouraged to increase the volume of loan able funds to small and medium scale enterprises, while elimination of multiple taxations, reduction in corporate taxes and the strengthening of government policy frame work were recommended. Safiyaay and Garba (2013) examined the role of commercial banks in enhancing the growth small and medium scale enterprises in Nigeria. It was discovered that commercial banks contribute to financing small and medium scale enterprises though their contribution has declined considerably as the government through Central Bank of Nigeria directives brought to an end the mandatory banks credit allocations. The paper hence recommended that commercial banks should often on its stringent requirements so that small and medium scale enterprises can benefit maximally from loan advances as large companies do.
A study by Duru and Lawal (2012) assessed the impact of financial sector reforms on the growth of small scale enterprises in Nigeria. The results indicated that all variables considered have significant positive impact on the growth of small and medium scale enterprises in Nigeria, thus the government should create and enabling environment small and medium scale enterprises to thrive.

3.0 METHODOLOGY

3.1 Sources of Data Collection
This research study is adopted with the empirical analysis to evaluate the contribution of small scale business to economic growth and development in Nigeria. Secondary data was used in the course of this analysis. The time series were obtained from the various publications of annual reports of the central bank of Nigeria. The data obtained include Real Gross Domestic Product (RGNP), continuous contribution of small scale enterprise.

3.2 Scope of the study
The series (data) covered 35 years period (1981-2015).

3.3 Descriptive analysis
These involve the use of graphical representation of the trend in the adopted macroeconomic variables Real Gross Domestic Product (RGDP) and small scale enterprise. The first step involves testing the order of integration of the individual series under consideration. Researchers have developed several procedures for the test of the order of integration. The most popular ones are Augmented Dickey Fuller test (ADF) due to Dickey and Fuller (1979, 1981), and the Phillip-Perron (PP) due to Phillips (1987) and Phillips and Perron (1988). Augmented Dickey Fuller test (ADF) relies on rejecting a null hypothesis of unit root (the series are non-stationary) in favour of the alternate hypothesis of stationarity. For the purpose of this study we will ADF in testing for the order of integration of the individual variables under study.

3.3.1 Econometric Analysis
In this section the result of the econometrics analysis using E-view is presented and interpreted for easy understanding. We start this presenting and interpreting the result of the ADF which tested the order of integration with a view to determine the stationarity of the individual variables included in the model.

3.4 Model Specification
This study employed simple regression in evaluating the effect of Small and Medium scale enterprise on the growth of Nigeria economy. This study adopted and modifies the model employed by Khan (2012). The choice of this kind of model is based on its property of BLUE (Best Linear Unbiased Estimate).

The model is implicitly specified as follows;
\[ \text{GDP} = \beta_0 + \beta_1 \text{GSMEs} + \epsilon_t \]  

The model is explicitly specified thus
\[ \text{GDP}_t = \alpha_0 + \alpha_1 \text{GSMEs}_t + \epsilon_t \]  

Where:
- \( \text{GDP} \) = Gross Domestic Product
- \( \text{GSMEs} \) = Growth of Small and Medium Scale Enterprises
- \( \alpha_0 \) = Constant or the intercept
- \( \epsilon_t \) = Stochastic error term

There has been several argument that the log form of a model produces a more reliable result than the non-log form due to the capacity of the log form to smoothen the data on this ground, a log form of the model is thus specified with a view to smoothen the data and to avoid the error of heteroscedasticity.

\[ \text{LOG (GDP)} = \alpha_0 + \alpha_1 \text{LOG (GSMEs)} + \epsilon_t \]  

3.5 Apriori Expectation
The result confirms the Apriori expectation of this study which assume that all forms of contributions made by small business has a positive relationship with the economic growth and development.

4.0 DESCRIPTIVE ANALYSIS
This section presents various findings drawn from the study. The following results are based on the research questions raised, which the study has sought to answer.

\[ \text{REAL_GDP} \quad \text{SBUS} \]
### Descriptive Statistics

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>20133.50</td>
<td>3464.831</td>
</tr>
<tr>
<td>Median</td>
<td>4588.990</td>
<td>859.831</td>
</tr>
<tr>
<td>Maximum</td>
<td>94144.96</td>
<td>18028.90</td>
</tr>
<tr>
<td>Minimum</td>
<td>144.830</td>
<td>12.49394</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>28608.18</td>
<td>5060.069</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.398183</td>
<td>1.504782</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>3.630695</td>
<td>4.122697</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>11.98377</td>
<td>15.04697</td>
</tr>
<tr>
<td>Probability</td>
<td>0.002499</td>
<td>0.000540</td>
</tr>
<tr>
<td>Sum</td>
<td>704672.3</td>
<td>121269.1</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>2.78E+10</td>
<td>8.71E+08</td>
</tr>
</tbody>
</table>

**Observations:** 35  35

The table above shows the result for the descriptive statistics of the variable. The mean value Real Gross Domestic Product (RGDP) is 20133.50 for the Small Business (SBUS) is 3464.831.

**Skewness:** The variables show positive values for skewness and this implies that the variables are skewed to the right. These indicate that the variables are normally distributed.

**Kurtosis:** Is a measure of peakedness of the variables has the following 3.630695 for the Real Gross Domestic Product (RGDP) and it has 4.122697 for the Small Business (SBUS).

**Jarque-Bera** which is also measure of normal distribution given the corresponding P – Values, we accept the Null hypothesis of normal distribution for all the variables.

**Figure 4.1: Trend Analysis**

The figure below shows the trend of the variable used in the research. This was done to achieve the first objective.

The graph above describes the trend of Real Gross Domestic Product (RGDP) scale from 1981 – 1991, the flow of the Gross Domestic Product (GDP) was relatively stable. In 1992, there was a gradual increase to 2003. From 2004 there was fast and continuous increase to 2015.
The graph above describes the trend of Small Business (SBUS) scale from 1981 – 1991, the flow of the business was relatively stable. In 1992, there was a gradual increase to 2003 which was at a slow rate. From 2004 there was fast and continuous increase to 2015.

**Table 4.2.1: Unit Root Result for Real Gross Domestic Product**
Null Hypothesis: D(LNREAL_GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-3.078419</td>
</tr>
<tr>
<td>Test critical values:</td>
<td></td>
</tr>
<tr>
<td>1% level</td>
<td>-3.646342</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.954021</td>
</tr>
<tr>
<td>10% level</td>
<td>-2.615817</td>
</tr>
</tbody>
</table>

Source: Computed by the Researcher, 2019

The above result shows that statistic has a value -3.078419 with a significant probability value of 0.0381 which in absolute term is greater than the 5% and 10% critical values respectively. This implies that variable is stationary after first difference and it is significant at 5% and 10% respectively. We therefore reject the null hypothesis (Ho) that LNGDP has a unit root. The result also indicates that the series is free from seeing spurious because Durbin-Watson (2.124970) is greater $R^2$ value 0.234127.

**Table 4.2.2: Unit Root Result for Real Gross Domestic Product**
Null Hypothesis: D(LNSBUS) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-3.706932</td>
</tr>
<tr>
<td>Test critical values:</td>
<td></td>
</tr>
<tr>
<td>1% level</td>
<td>-3.646342</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.954021</td>
</tr>
<tr>
<td>10% level</td>
<td>-2.615817</td>
</tr>
</tbody>
</table>

Source: Computed by the Researcher, 2019

The above result shows that statistic has a value -3.706932, which in absolute term is greater than the test critical values at 1%, 5% and 10% respectively with a probability by significant value of 0.0086. This implies that the variable are stationary after first difference and it is significant at 1%, 5% and 10% respectively. We
therefore reject the (Ho) null Hypothesis that LNSBUS has a unit root. The result also further emphasis that the seen is free being spurious and this was confirmed by Durbin-Watson 2.025492 which is greater than the R\textsuperscript{2}value of 0.307129.

Table 4.3: Unit Root Result for Real Gross Domestic Product

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2.464374</td>
<td>0.068653</td>
<td>35.89597</td>
<td>0.0000</td>
</tr>
<tr>
<td>LNSBUS</td>
<td>0.915517</td>
<td>0.010125</td>
<td>90.41868</td>
<td>0.0000</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.995980</td>
<td>Mean dependent var</td>
<td>8.268007</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.995858</td>
<td>S.D. dependent var</td>
<td>2.239233</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.144114</td>
<td>Akaike info criterion</td>
<td>-0.980980</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>0.685371</td>
<td>Schwarz criterion</td>
<td>-0.892103</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>19.16715</td>
<td>Hannan-Quinn criter.</td>
<td>-0.950300</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>8175.537</td>
<td>Durbin-Watson stat</td>
<td>0.364600</td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Computed by the Researcher, 2019

The Simple regression analysis was carried out to examine or ascertain the magnitudes of small business enterprises on economy growth. The result above shows that the dependent variable economic growth is explained by the explanatory variable small business enterprises as contribution by 99% over the period under review. That is $R^2=0.99$ (99%).

Put differently, 99% variation in GDP is accounted for by small business. The regression equation can therefore be stated as:

\[ Y = 2.4644 + 0.9155(X). \]

Where:

\[ Y = \text{Estimated Gross Domestic Product} \]
\[ X = \text{Different values of contributions of small scale business to economic growth and development}. \]

The regressions above also show that there is a significant relationship between small scale business and economic growth, evident by t-Statistics and probability value. $P < 0.1$

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

There is no doubt that small scale enterprises are essential for rapid and sustained economy growth and development because they create employment, enhance capacity building for manpower and skills development, promote growth, reduce poverty, and facilitate industrial development among others. Several efforts had been made by successive governments to promote human and materials resources. These efforts have made small and medium scale businesses to contribute significantly to the development of Nigeria economy.

In spite of government policies aimed at providing financial and technical support for the promotion of small business enterprises in Nigeria, they have performed less satisfactorily largely because of operational bottlenecks including lack of depth of the financial system, inadequate infrastructural facilities, poor management practices and low entrepreneurial skills to mention but a few. Banks which are supposed to provide adequate credit facilities in compliance to government policies usually place exorbitant interest rate alongside huge collateral securities that scare away investors. Despite all these bottlenecks, small scale businesses have contributed significantly to economic, social and development of the country.
5.2 Recommendations

Governments should assist prospective entrepreneurs to have access to finance and necessary information relating to business opportunities, modern technology, raw materials, market, plants and machinery which would enable them to reduce their operating costs and be more efficient to meet the market competitions. It is also recommended that there is need for supporting and strengthening small and medium scale enterprises productive capacities and market competitiveness in the country.

Small and medium scale enterprises owners as a matter of necessity should take insurance policies for their businesses as this may not only help to protect them against uncontrollable risks, but will help to bring them back to their positions whenever they suffer losses, remain profitable and continue to operate in perpetuity, at the same time contributing to the economic growth of the nation.

Prospective business operators should conduct extensive feasibility studies, to evaluate the viability of any proposed business, and to avoid investment in unprofitable ventures. Governments should encourage and continue to build on current programmes and establish new ones if warranted, to improve the levels of managerial competence and skills of the small business owners.

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ABSTRACT

Women are unique beings on the planet. Their roles in the society cannot be underrated. In the olden days, women were barred from participating in some activities thus prevented them from occupying top positions in the society (country). During this period, the labour force was low and the GDP of the country was low as well. But as soon as the government formulated a policy about gender equality, this embargo on feminine recognition was removed. Though, they may be termed “weaker vessels”, but strong in action and always determined to utilize themselves. They are good instrument in reducing poverty and increase economic growth with better understanding of their existence that they are not only for sex and reproduction but also to be useful in the society. This paper defined HRM, economic growth and examined the inclusion of women in some spheres in HRM like agriculture, education and politics and how they have contributed positively to the economic. It also explained the reasons why they have a better chance of contributing to the economic growth. Lastly it concluded that women are strong and capable of positively influencing wherever they are and made some recommendations.

Key words: Women, gender, Equality, Economy, Human Resources Management

1. INTRODUCTION

Handling people requires a tactical approach because of responsiveness nature of man which makes them think, feel and act. Human being cannot be operated like machine, because they differ widely and are subject to many varied influences. The management of man is a very important and challenging job because of the dynamic nature of the people.

Ganesan, (2014) opined that human beings, as one of the vital resources, need a tactful handling by management personnel. Over the years, men were given full autonomy to boss actually all the organizations which has marginalized the women. These disparities in term of social, political and other aspects between men and women brought about low participation of women in politics and limited rights in terms of access to some resources and opportunities (opportunities in terms of education, training, occupation, etc.). The argument has been that they are naturally mothers, and their greatest pleasure and true fulfillment lies in maternity, the one out of a few things that women are good at as contributed by Okoycuzu, Obiamaka and Onwumere (2012). These kinds of ideologies about women have tended to marginalize them and have belittled their work in the home and outside the home and prevented them from contributing to economic wellbeing of the home and society until 1999, when the constitution of Nigeria clearly stipulates gender equality.

Bradshaw, Castellino and Diop (2013) observe that while gender equality will help bring economic growth, economic growth will not necessarily bring gender equality. Alphizar (2010) opined that advancing gender equality requires strengthening different dimensions of women’s autonomy: economic, political autonomy, full citizenship and freedom from all forms of violence, and sexual and reproductive autonomy. Therefore, increase in goods and services tending to economic growth could be attributed to improvement in the citizen’s workforce.

There is valuable relationship between human resources management and economic growth the success of any organization lies greatly on the efficiency and effectiveness of the management team. According to Geet, Deshpande and Deshpande (2009), human resources has a paramount importance in the success of any organization because most of the problems in organizational setting are human and social rather than physical, technical, or economical failure.

1st National Conference of WITED, Ilaro Chapter
The truth remains that when a woman has understanding of how to run a home, then, she can understand the problems inherent in running a business and a country. Nigeria as a nation is blessed with courageous, hardworking and aggressive women who cannot be ignored in the economic, political and social growth of the country. They made selfless efforts to ensure the growth of the economy in their generation.

This paper tends to eradicate gender inequality and appreciate female participation in all spheres of the economy towards its growth. The ideology that women should remain at home to care for the family (children and husband) should be changed, we should rather exploit the inbuilt talents and gifts in them.

During the regime of Dr. Goodluck Jonathan, he appointed Dr. Ngozi Iweala to be the Minister for Finance. Not only that, there are still other women in the realm of politics, commerce, agriculture, education, etc. whose landmark cannot be forsaken in the country.

This paper serves as an eye opener to the religion and community leaders who still believe that women are not relevant and cannot meet up with men, thus marginalizing them. Also, when a woman loses her husband (widow) she is no more relevant in some area (due to their cultural belief). This should be addressed in order to let out the nature, beauty and ability of such woman.

Furthermore, this paper will be a protective apron for women in the society against public embarrassment and harassment in the practice of gender equality.

Not only that, the idea of some men that if you allow women to be educated, their response to sex will be low. There must be a change of idea that, if you educate a woman, you have educated a nation, as educated women are good agents in HRM which eventually increases the nation’s economy.

Statement of The Problem
The study of Okoycuzu, Obiamaka and Onwumere (2012) had shown that women which constitute half of the world’s human capital are one of the most underutilized resources in the world. According to Okoycuzu, Obiamaka and Onwumere (2012), Nigeria still falls short of the desired result of giving males and females equal opportunities and equal access to opportunities to advance socially, economically and politically. But since the constitution recommends gender equality, women have been fully contributing to the economic growth.

Despite the active contributions and selfless efforts of women, some of them are still marginalized when it comes to some activities on the ground of religion, and cultural belief. There is need to sensitize all about making full use of feminine impact in our society for sustainable development and growth in all ramifications.

This underutilization of the feminine power, knowledge and wisdom could still be attributed to gender inequality in such areas. Women are good instrument, advertising agents and good representatives. They are always ready to serve and be utilized. Therefore, change of action and orientation is called for in such area or part of the country.

2. LITERATURE REVIEW

2.1 Conceptual framework of Economic Growth

Amadeo (2019) defines economic growth as an increase in the production of goods and services over a specific period. To be most accurate, the measurement of economic growth removes the effect of inflation in a country. He stressed further that, economic growth creates more profit for businesses. As a result, stock prices rise. That gives companies, both private and public, capital to invest and hire more employees. As more jobs are created and there is rise in income, consumers have more money to buy additional products and services.

Amadeo (2019) opined that Gross domestic product is the best way to measure economic growth. It takes into account the country’s entire economic output. It includes all goods and services that businesses in the country produce for sale. It doesn’t matter whether they are sold domestically or overseas.

GDP measures final production. It doesn’t include the parts that are manufactured to make a product. It includes exports because they are produced in the country. Imports are subtracted from economic growth. The most accurate measurement of growth is real GDP. It removes the effects of inflation. The GDP growth rate uses real GDP.

He further explains that GDP doesn’t include unpaid services. It leaves out child care, unpaid volunteer work, or illegal black-market activities. It does not count the environmental costs. A country will improve its standard of living when it factors in environmental costs. A society only measures what it values.
According to Online Management Study guide, there are two different definitions. The first definition of HRM is that “it is the process of managing people in organizations in a structured and thorough manner. This covers the fields of staffing (hiring people), retention of people, pay and perks setting and management, performance management, change management and taking care of exits from the company to round off the activities. This is the traditional definition of HRM which leads some experts to define it as a modern version of the Personnel Management function that was used earlier.

The second definition of HRM encompasses “The management of people in organizations from a macro perspective. i.e. managing people in the form of a collective relationship between management and employees.” This approach focuses on the objectives and outcomes of the HRM functions. It means that the HR function in contemporary organizations is concerned with the notions of people enabling, people development and a focus on making the “employment relationship” fulfilling for both the management and employees.

The scope of HRM is indeed vast. All major activities in the working life of a worker – from the time of his or her entry into an organization until he or she leaves the organization comes under the preview of HRM. The scope of Human Resources Management extends to:

i. All the decisions, strategies, factors, principles, operations, practices, functions, activities and methods related to the management of people as employees in any type of organization.
ii. All the dimensions related to people in their employment relationships and all the dynamics that flow from it.

![Diagram of HRM](Source: Ms. Sinha Ragini, Civil India Service, Section III, Human Resource Management Online)

**Figure 1. Scope of HRM**

(Source: Ms. Sinha Ragini, Civil India Service, Section III, Human Resource Management Online)
2.2 Theoretical framework

Different theories have been used to explain and address gender inequalities in the society, which include Liberal feminism, Marxist feminism, Radical feminism and Social feminism according to Samkange (2015). These theories generally agree that there is oppression and inequality based on gender but only differ on the approaches they advocate to have these imbalances within Society addressed as stressed by Samkage (2015). This paper is limited to Liberal feminism theory which advocates for a moderate approach to bringing about change in gender treatment.

2.3 Liberal Feminist Theory

Owens (1994) defines the theory as a thought process or way of thinking about reality which becomes a model of that of thinking about reality which becomes a model of that reality. Brookes (2008) explains the theory within this context as an individualistic form which concentrates on women having their equality through being responsible for their actions and choices.

Giddens (2001) also defines Liberal feminist theory as a theory that believes gender inequality is produced by reduced access for women and girls to civil rights and allocation of social resources such as education and employment.

Tong (2009) added that feminist theories attempt to describe women’s oppression, explains its causes and consequences, and prescribe strategies for women’s liberation. According to Khattak (2011), Liberal feminist theory is characterized by an individualistic emphasis on equality. Gender equality allows women to enjoy their right to education, politics, agriculture, e.t.c. this holds that women should live lives of their own choosing in terms of carrier, employment opportunities.

Although both governmental and non-governmental organizations have made tremendous efforts with the framework of liberal feminism, the achievement is not sufficient. This means that women are still victims of various economic, political and socio-cultural problems which become challenges facing the women to overcome the state of being barred from occupying top positions and achieve gender equality as opined by Enyew and Mihrete (2018).

2.4 Empirical Review

Identification of women as bring a reliable and productive labour force makes them to be prepared. They are also recognized to be more efficient distributors of goods and services within the household. Therefore they have been targeted to be a good instrument in HRM for the growth of the economy which eventually aimed at alleviating poverty.

Today, economic benefits from gender diversity in the workforce are being stressed in addition to equal opportunity norms or mere compliance with the Equal Opportunities legislation which employers often feel coerced to comply with. Equal Opportunity norms demanding gender diversity in highly visible organizational positions come from a number of different stakeholders, including the media, investors and employees themselves.

In addition, the reputation and credibility of a firm in both internal and external labour markets seems to improve by including, women on the board (Daily & Schwenk, 1996; Hambrick & D’Aveni 1992). The persistence of sexual stereotypes has led organizations to allocate women within top management to a function that is strongly associated with female stereotypes such as the HRM function. In this respect, assigning women to HRM offered a solution for organizations to deal with growth demands for enhancing diversity within top management without giving up the traditional classification of female and male work. When these two mechanisms: interest of organizations to include women in highly visible positions and sexual stereotyping prevail correspondingly, this leads to the rise in female representation and a parallel rise in status of the occupation which can be seen from this recent study on women in HRM in 11 western European countries as observed by Riechel, Bradl and Mayrhofer (2010). Okafor and Akokuwebe (2015) and Amazons Watch magazine 2018 make a list of some Nigeria women who through their involvement in Human Resources Management have contributed to the growth of Nigerian economic in diverse ways like politics, agriculture, religion, industry, education.
Mrs. Funmilayo Ransome – Kuti and Mrs. Magaret Ekpo in the Nigerian Pre-independence political struggles of the 1950’s. Mrs. Kuti was a strong advocate and campaigner for women’s rights across the country. Mrs. Magaret Ekpo, was the only female member of the seven-man committee set up in 1951 to organize a national political organization toward achieving self employment within five years.

Professor (Mrs.) Grace Allele – Williams in the field of mathematics education and rose to become the University of Benin.

The battle of women to become equal with men in all aspects of life and work has been in existence over the years. Enormous advances in education and career have been made but to equalize them in pay and promotions in the workplace was a mirage to them. The belief was that they are the property of their husbands. Over the last 93 years, women have made great advances toward equality but total equality in pay, executive positions and high earning positions still elude them making it imperative for HR managers to alleviate this lingering quandary as observed by Kaifi (2013). According to Parcheta, Kaifi and Khanfar (2013), as of 1963, the equal pay Act requires employers to pay similar wages to employees who perform the same tasks without regard to gender. Although, some employees do earn more than others because of performance, seniority and/or work conditions. Education has been the key that gave women entrance into the realm and arena of earning more money.

Involvement of women in different career and getting degrees in different areas that are income producing like Engineering, IT, Business, Finance, Construction, etc. has given them opportunity to rise to the top to be leaders in one area or the other. Some women are bold and more competent than some men, hence, their management style has been an asset to the company or the organization they are. In this respect, Afugoo D. (2011) observes that, assigning women to HRM offers a solution for organization to deal with growing demands i.e. to improve the production of goods and services in order to enhance economic growth.

Late Prof. Dora Nkem Akunyili (OFR) was the former Director of National Agency for Food and Drug Administration and Control (NAFDAC) who reduced the incidence of fake drugs from about 90% to 68% in 2001 as confessed in one of her addresses in April, 2006.

Dr. Mrs. Okonjo Iweala under the Obasanjo regime (2003 – 2006) as the Nigerian Minister of finance who successfully transformed the Nigerian economic platform by negotiating a debt relief package for Nigeria. She also stressed the need to reduce the country’s recurrent expenditure and embark on capital projects which could improve the 14% employment rate in the country as reported by Aina, (2012); McGroaty (2012) and Osa-Okunbor (2012).

There are more women in managerial positions in various establishments. Okoyeuzu, Obiamaka and Onwumere (2012) express the participation of women to have astounding impacts in Commerce, Industry, Banking, Education, Administration as well as politics. He believes that when you educate a woman you educate a nation. When education is achieved, skills are developed for active participation in all aspect of life in the society. He further asserts that the contributions of women have been felt in reducing poverty through agriculture thus increasing the growth of the economy.

According to World Bank (2002), the primary pathways through which gender systems affect growth are by influencing the productivity of labour and the allocate efficiency of the economy.

Identification of women as being a reliable, productive and cheap labour force makes them the preferred work force in many organisations. Perception of women as ‘good with money,’ including being better at paying back loans, has led them to be targeted in microfinance programmes. Recognition of women as more efficient distributors of goods and services within the household has led to the being targeted with resources aimed at alleviating poverty, such as cash transfer programmes as explained by Bradshaw, Casterline and Bineta (2013).

Alphizar (2010) opined that the justification for including women in development in economic growth has been an efficiency argument, with equity concerns being somewhat secondary. Critics suggest this instrumentalist approach to engendering development, while bringing economic growth gains, will not fundamentally change the position and situation of women.
Julie (1995) concludes that, “indeed our monetary economy is dependent on women’s reproductive and care giving work for the health, wellbeing and indeed the very existence of the paid work force. The economy also relies heavily on women to pick up slack which the paid economy ignores – nursing elderly people, tutoring, child care and supporting new immigrants”. Sulaiman, Babalola and Idris (2013) added that most economists and women activities (including international institutions like ILO, and other), have considered that women productivity contribution as important and subsidized the overall output in the economy.

In industry, According to Sulaiman, Babalola and Idris (2013) As industrialization grows to respond to export demand it relies on female labour. This is because historically, developing nations start their export industries with the manufacture of products which use female labour. With the rapid development of the export sector, it is therefore expected that female labour will play an important role in the development of the industrial sector in Nigeria, change the indexes and speed the overall hallmarks of growth. These (female labour and overall growth policies) are important towards achieving the targets of the Millennium Development Goals buy the year 2015 for empowering women in Nigeria which is still a long way.

In agriculture, the international development community has recognized that agriculture is an engine of growth and poverty reduction in countries where it is the main occupation of the poor. But the agricultural sector in many developing countries is underperforming, in part because women, who represent a crucial resource in agriculture and the rural economy through their roles as farmers, labourers and entrepreneurs, almost everywhere face more severe constraints than men in access to productive resources. Efforts by national governments and the international community to achieve their goals for agricultural development, economic growth and food security will be strengthened and accelerated if they build on the contributions that women make and take steps to alleviate these constraints.

Sofa and Chery (2011) opined that women make essential contributions to the agricultural and rural economies in all developing countries. Their roles vary considerably between and within regions and are changing rapidly in many parts of the world, where economic and social forces are transforming the agricultural sector. Rural women often manage complex households and pursue multiple livelihood strategies. Their activities typically include producing agricultural crops, tending animals, processing and preparing food, working for wages in agricultural or other rural enterprises, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes.

3. FACTORS FOR WOMEN’S INCLUSION IN HUMAN RESOURCES MANAGEMENT

Parcheta, Kaifi and Khanfar (2013) asserts that women are at more concerned with the wellbeing of others compared to men; they are more approachable as managers which leads to more creativity and stronger teams. When these characteristics prevail in women, the organization/company earns more, the workers enjoy their working environment which makes them to produce more and increase their productivity. All these (goods – production and services – management) contribute to the increase in the level of economic state of the country or the environment in question.

Riechel, Bradl and Mayrhofer (2010) argue that the inclusion of women in HRM top positions since the 1990s is as result of two related mechanisms – the inherent limitations of the equal opportunities legislations and the mounting rhetoric about the link between diversity and performance accompanied with the increasing societal pressures to include women at all organizational levels.

Gender Assessment Report in Nigeria (2009) cited by Sulaiman, Babalola and Umar (2013) reports that women constitute about 60% of the agricultural labour force and performed more than 70% of farm labour. These reasons have made organizations include women into top management positions and since the beginning of their inclusion, women have changed their emphasis from the mere inclusion in the workforce to enabling them to reach top management.

The findings of Fagool (2011) shows that that in societal contexts, countries displaying higher gender egalitarian values showed less sex-role differences between male and female directors. The incidence of such gender egalitarian values opens up elite male domains to women in the HR field. In the HRM include functional HR responsibilities which were usually considered as a male stereotypes domain.
Country gender profile Nigeria (2011) establishes that the national Gender Policy focuses on women empowerment while taking action in basic education and the abolishment of traditional practices which are harmful to women. The aim is to reduce gender bias that arises from traditional cultural customs.

The Strategic Initiative on Gender holds goals to achieve empowerment for women’s political capacity, and has established a gender-sensitive framework for both public and private sector. It also aims to have 30% of managerial positions occupied by women by 2015. Also, although CEDAW was ratified in 1985, implementation and operation on a practical level is insufficient. This has sustained the women to participate in the different areas to boost the economy.

4. CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The contribution of women in HRM towards economic growth cannot be sidelined. It is glaring that women are good resources to be tapped unto promote efficiency in some spheres of the country towards economic growth. Women’s contribution in HRM via politics, education, agriculture, small scale business and others is a good measure of economic growth being goods and services. Their risk taking behaviour worthy of appreciating in the economy. The policy of gender equality has unveiled the marginalization of women to the top. Women are self dependent unlike when they were not allowed to exert their being which made them poor and depend their total being on men as they remained unpaid from their domestic work. As soon as they entered paid work, many things turned around and become bread winners in the family. In actual sense, the present status of any country depends on the extent their women are allowed to participate in HRM.

4.2 Recommendations

Due to the fact that the women who have been allowed to get to top positions and play a visible and outstanding role in HRM contribute greatly to the economic growth, the following recommendations are made.

- Religion and cultural belief should not prevent the women from performing their right as the citizen in politics (right to vote and to be voted) education (acquire good education as an adage says “education is light), etc.
- There should not be limitation to their participation in the leadership
- There should be a law enacted by the government to allow widow to do what he could in HRM (this might be particular to some ethnic group).
- Women who have not come out of their shell should do so, to demonstrate their natural intelligence.
- There must be understanding that managing women is not like managing men. Women might not like to open up like men.
- There must not be underestimation of what any woman can do. Not the face, outlook but the inward, knowledge, experience and wisdom that matter.
- It is important to close gender gap by either mentoring and training or awareness and accountability or work life balance.
- It should be noted in any organization or society that having gender parity as a checklist of action do not produce result but long time commitment to it.

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IMPACT OF TOTAL QUALITY MANAGEMENT ON ORGANISATIONAL PERFORMANCE OF FEMALE STAFF IN DANGOTE CEMENT PLC. IBEASE, OGUN STATE

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ABSTRACT

This study examines the impact of total quality management on organisational performance of female staff in Dangote cement plc. Ibeese, ogun state. A survey design was adopted for the study where questionnaire was the instrument used to elicit information from 70 academic staff from 5 Schools (Faculties) in Federal Polytechnic, Ilaro. A convenience sampling technique was used to select the respondents based on gender and age. Two (2) modified and adapted instruments tagged Survey on the Implementation of Total Quality Management and an instrument with variables regarding organizational performance by (Lau & May, 1998) were used for data collection. Product moment correlation and multiple regression analyses were used in analyzing the data collected. This result shows that there is a positive and significant relationship between management commitment, staff orientation, employees’ commitments and organizational performance. Furthermore, a unit increase in management commitment, staff orientation and employees’ commitment will cause 2.189, 3.015 and 3.816 unit increases in organizational performance provided other independent variables are held constant. It was concluded that total quality management practice has significant impact/contribution to organizational performance. The study therefore recommended among others that Top management should actively participate in quality management activities, strongly encourage employee involvement in quality management activities, purses long term business success and discusses many quality related issues in top management meeting.

Keywords: Total Quality Management, Organisational Performance, Operational Efficiency, Employee Satisfaction

1.0 INTRODUCTION

In response to increase global pressures customers’ demanding superior quality of products and services, the global market place has become very competitive, many organizations have adopted practices such as total quality management (TQM), and benchmarking. Many scholars claim that managers can implement TQM in any organization in any sectors of the economy such as manufacturing, service, education, and government (Dean & Bowen, 1994), and that it generates improved products and services, more satisfied customers and employees, reduced costs, improved financial performance, enhanced competitive, and increased productivity (Zu, 2009). The pioneers in TQM, such as Deming, Juran, Cosby and Feigenbaum, highlighted the importance of the quality philosophy as an essential competitive weapon for the transformation of an organization.

Total Quality Management (TQM) is a philosophy and set of guiding principles that represent the foundation of an excellent organisation and to ensure survival of industrial organisations in the competitive economy of today (Besterfield, 1999). Total Quality Management is a technique that underscores the continuous improvement of product and service quality to satisfy customers and enhance productivity. The emergence of Total Quality Management has been one of the most significant developments in recent management practice. The focus on the development of Total Quality Management (TQM) systems appears to have begun around 1980 in response to Global competition and stiff rivalry in the manufacturing subsector arising from Japan (Easton and Jarrell, 1998). In the last three decades, Total Quality Management has become pervasive and widely accepted in manufacturing, services, government, healthcare and banking subsectors of the developed economies (Fotoponlam & Psomas, 2009). Al-swadi and Mahmood (2012) and Temtime (2003) assert that continuous attention has been given to TQM in the industrialised countries but researchers investigated quality practices in the developing countries in the last ten years.
According to Moballeghi and Moghaddam (2011), there is a growing awareness that a well-designed and well-executed Total Quality Management process is one of the most effective routes to increase product and service quality, productivity and profitability. However, many organisations are still mired in “quality confusion”. This scenario is a common phenomenon in Nigeria. Quality of products has been identified as one of the critical determinants affecting the performance of most organizations in Nigeria. In response to the poor quality and substandard products in wide circulation alongside the attendant adverse effect on the lives of the citizens and the economy, Nigerian government established the legal and the institutional framework to curb the ugly trend and menace in the country. The Government of Nigeria set up regulatory agencies such as Standard Organisation of Nigeria (SON), National Agency for Food, Drug and Administration Control (NAFDAC), Nigerian Drug and Law Enforcement Agency (NDLEA) and Consumer Protection Council to safeguard the unsuspecting public against unethical practices and improve the quality of goods and services produced by business organizations.

Most business organization within the manufacturing and service industries have in one time or the other experienced a drop in their level of productivity while some are still suffering from it till today. At one time, managers believed that there was an inevitable trade between productivity and quality. They thought that the two were diametrically opposed that is, increasing one meant decreasing the other. Today however through a systematic application of TQM, effective managers consider productivity and quality as two sides of the same coin that is increasing one meant increasing the other (Moballeghi & Moghaddam, 2011).

According to Fauzia, Abid and Faisal (2014) the growing number of employee empowerment and top management and active participation of team-work in the organizations, firms are under top management to consider the total quality impact of their products and processes throughout the total quality management practices. Top management and employee empowerment, job performance are three important reasons for firms to adopt Total quality management practices. Customer’s focus and leadership commitment and team work also providing motivations for the total quality management principles in India (Fauzia, Abid & Faisal, 2014).

Performance measurement is critical for the organizational effectiveness. Organizational performance comprises the actual output or results of an organization as measured against its intended outputs (or goals and objectives). Organizational performance involves the recurring activities to establish organizational goals, monitor progress toward the goals, and make adjustments to achieve those goals more effectively and efficiently. While examining the relationship between quality principles and practices and performance scholars have used different performance types such as financial, innovative, operational and quality performance (Rula, 2017).

Rula (2017) measures organisational performance with two performance variables, which are the satisfaction level measured by employee satisfaction, and operational performance results which will be measured by operational efficiency.

A brief description of each measure was discussed but the focus of this study will be on the satisfaction level

**Operational Efficiency**: It is the company converts inputs into outputs in the form of products and services more valuable than the value of the inputs through the conversion processing. Operational efficiency was measured by following indicators: - unit cost, quality, delivery, flexibility, and speed of new product introduction.

**Employee satisfaction**: is a measure of how workers are pleased with their job and working environment. Different factors influencing employee satisfaction such as: working condition, job safety and security, rewards system and career development.
However, this study was focus on the satisfaction level which was measured by employees satisfaction.

1.2 Statement of Problem

For total quality management to be successful, there has to be Top management commitment to it. In many cases, where total quality management is practiced, management often show signs of greater commitment of determination to achieve the success. Most of the companies that practice total quality management pursued their total quality management efforts for 10 years before seeing returns. This may be due to pressures faced by management to set priorities that will help to maintain or improve company’s performance. Total quality management application requires that management dedicate time, money, labour and other resources, since this is the case, total quality management often conflicts with higher priorities or initiatives. Consequently, management may out of necessity or convenience redirect its attention or resources to other priorities.

Another problem that is associated with total quality management practice which invariably has a dwindling effect on performance is lack of skill and knowledge about the market. Inadequate market orientation has caused many organizations a lot in terms of high cost of rework. Before providing services or development of product, some organizations failed to conduct market research to know the market requirements and specifications, thus affect their level of productivity.

Lastly, it appears that the general feeling concerning total quality management is that employee cooperation is not recessively needed. Total quality management is seen as a culture which requires management to loosen reigns and give employee greater role in managing the firm.

1.3 Significance of the Study

The successful findings of this research work will throw more light into the needs for effective Total Quality Management. The following finding of the study will therefore be useful to:

1. Management of any company concern, in that they will understand the effects of TQM on their productivity as an organisation which will help in the formation of the right policies and development of the right strategies.
2. The findings of this research work will be useful to different stakeholder groups which include other cement company (ies), employers, investors and the general public.
3. In particular, the findings will enable the industry and other employers/organizations to review their policies and procedures of participation in TQM activities. The models will help in motivating the employees in related organizations to get more involved in TQM activities in order to increase their productivity.
4. The study will go a long way in creating a foundation for further research which may benefit future authors/scholars.

1.4 Objectives of the Study

The main objective of the study is to determine the statistical impact of Total Quality Management on Organisational productivity, reference to Dangote cement Plc. Other objectives include:

1. To ascertain the positive relationship between top management commitments (leadership) and organizational performance
2. To determine the effect of staff orientation on organizational performance
3. To find out the positive relationship between employees' commitments and organizational performance.

1.5 Research Questions

Below are the question raised which will guide the conduct of this research

4. What is the relationship between Top Management commitments (leadership) and organizational performance?
5. What is the effect of staff orientation on organizational performance?
6. What is the relationship between employees’ commitment and organizational performance?

1.6 Research Hypotheses

The following hypotheses were formulated to guide the conduct of this research:

H01: There is no positive relationship between Top Management commitments (leadership) and organizational performance.

H02: There is no significant effect of staff orientation on organizational performance.

H03: There is no relationship between employees’ commitment and organizational performance.

2.0 METHODOLOGY

A survey design was adopted for the study where questionnaire was the instrument used to elicit information from 70 female academic staff from 5 Schools (Faculties) in Federal Polytechnic, Ilaro. A convenience sampling technique was used to select the respondents based on gender and age. The age range of the respondents is between 21-50 years. Two (2) modified and adapted instruments tagged Survey on the Implementation of Total Quality Management and an instrument with variables regarding organizational performance by (Lau & May, 1998) were used for data collection. Product moment correlation and multiple regression analyses were used in analyzing the data collected.

Results

Regression Coefficient Table (ANOVA)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>20.964</td>
<td>6.256</td>
<td>0.000</td>
</tr>
<tr>
<td>MANCOMM</td>
<td>2.189</td>
<td>3.556</td>
<td>0.000</td>
</tr>
<tr>
<td>STAFFORIN</td>
<td>3.015</td>
<td>4.091</td>
<td>0.000</td>
</tr>
<tr>
<td>EMPCOMM</td>
<td>3.816</td>
<td>3.889</td>
<td>0.000</td>
</tr>
</tbody>
</table>

R = 0.711
F = 42.715

Source: Author’s computation, SPSS.

The result in table 6 shows the regression coefficient for management commitment to be 2.189 with t-value of 3.556 and sig value (p-value of 0.000). The regression coefficient for staff orientation is 3.015 with t-value of 4.091 and sig value (p-value of 0.000) and the regression coefficient for employees’ commitments is 3.816 with t-value of 3.889 and sig value (p-value of 0.000)

3.0 RESULTS AND DISCUSSION

This result shows that there is a positive and significant relationship between management commitment, staff orientation, employees’ commitments and organizational performance. Furthermore, a unit increase in management commitment will cause 2.189 unit increases in organizational performance provided staff orientation and employees’ commitments are held constant. In the same vein, a unit increase in staff orientation will cause 3.015 unit increases in organizational performance provided other independent variables are held constant.

Also, a unit increase in employees’ commitment will cause 3.816 units increase in organizational performance provided management commitment and staff orientation are held constant. All the variables are significant with p-values (sig value) less than 5% significance value.
The correlation coefficient is 0.711, which indicates that there is a strong positive relationship between joint effect of management commitment, staff orientation, employees’ commitment and organizational performance. Also, about 50.55% variation in organizational performance is attributed to joint effect of management commitment, staff orientation and employees’ commitment.

Moreover, the F-value is 42.715 with sig value of 0.000 shows that the model is sufficient and adequate in relating thee variables (dependent and the independent variables) under study. This is in line with Fauzia, Abid and Faisal (2014) that the growing number of employee empowerment and top management and staff orientation in the organizations, firms are under top management to consider the total quality impact of their products and processes throughout the total quality management practices.

Top management and employee empowerment, staff orientation are three important reasons for firms to adopt Total quality management practices. Customer’s focus and leadership commitment and staff orientation enhances organisational performance (Fauzia, Abid & Faisal, 2014).

Hence, we can now accept the null hypothesis for the three hypotheses because all of them are significant. We then conclude that:

- There is positive relationship between top management commitment (leadership) and organizational performance.
- There is significant relationship between staff orientation and organizational performance.
- There is positive relationship between employees’ commitment and organizational performance.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

Total quality management is a philosophy and principle that guide organization in ensuring quality service delivery and effective organization performance. Based on the result of this study. It was concluded that total quality management practice has significant impact/contribution to organizational performance. Effective total quality management practice through adequate staff orientation, maximum commitment of management and employee commitment to service delivery will facilitate organizational performance of Federal Polytechnic Ilaro and other organizations. Where management have reasonable level of commitment to quality performance and employs appropriate measure to engender the commitment of employers to quality works, the overall organizational performance will be high.

4.2 Recommendations

To better utilize total quality management to improve organization performance, the researcher therefore recommends the following.

1. It has been found that top management commitment can positively impact on organizational performance. Top management should actively participate in quality management activities, strongly encourage employee involvement in quality management activities, poses long-term business success and discusses many quality related issues in top management meeting.

2. Organization should continually train its staff, allocating firm resources to training on quality payoff as professional employees know advanced statistical technique, concept of quality basic characteristics of the firm. Furthermore, treating employee as a valuable resource increase their loyalty to the firm, motivate them and make them proud of their job, improve their work related performance decrease absenteeism and reduces intention to quit.

References


1st National Conference of WITED, Ilaro Chapter


LOW PARTICIPATION OF FEMALE GENDER IN SCIENCE AND TECHNOLOGY: CAUSES AND WAY FORWARD

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ABSTRACT

Low participation of females in Science and Technology among their male counterparts for national development has been a cause of concern in Nigeria. This paper proposed the causes for low turnout and the way forward for more impactful science and technology advancement in Nigeria. Quantitative research method was adopted to properly analyze and give a clear picture of the study. Structured Questionnaire on a five point Likert scale was administered purposively to a sample of 300 female students in the school of management studies, Federal Polytechnic, Ilaro, Ogun State. Analysis was done using descriptive and inferential approach. Results of empirical analysis indicates that peer group influence, discouraging school curriculum, culture of marginalization and poor foundation in mathematics, were found to be the major impediments to female gender low participation in Science and Technology as evidenced from the factor loadings. The identified variables were calibrated for model development using OLS approach for test of significance as respective 36%, 17.6%, and 17.1% on PGI, DSC, and PFM directly influenced female gender low participation. Significance of the model was tested using student “t” approach and were also found to be significant based on their respective p-values (0.000, 0.002, and 0.021) < α=0.05 significance level. Empirical analysis of the research study suggests that use of ICT in teaching of science and technology based courses in schools, giving career talks by successful female in Science and Technology fields and provision of gender equality in terms of job placement will increase female gender participation for technological advancement in Nigeria.

Keywords: Science and Technology, Socialization Weighted Average, Cognitive Ability, Factor Loadings

1. INTRODUCTION

Participating in Science and Technology education is important to support female genders role as users and innovators of technologies as well as researchers, scientists and technologists. Female gender has long been underrepresented in Science and Technology education and employment, and much has been done to understand the causes and identify Gender equality is fundamental to achieving poverty reduction and socio-economic development: this results from the central and vital role that women play in society through their contribution to productive activities and their role as social educators and family caretakers. Low participation is problematic not only from a rights point of view, but also from an economic angle.

According to United Nations Division for the Advancement of Women (DAW), in an era where economic growth is often linked to a country’s capacity for innovation, women’s contributions become especially important. Women help diversify research and development teams, bringing different points of view that can fuel creativity and result in better quality outputs. For example, in 2007, American IT patents produced by mixed-sex teams had higher citation rates than those produced by male-only or female-only teams. (DAW )

Due to problems in attracting and retaining girls and women in science and technology there are fewer women at every career step in this field. The lack of female role models and issues related to work life balance are other factors that may hold back girls and women in choosing and staying in Science and Technology. Some even believe that role of a women is for childrearing and taking care of the family. Therefore, their participation in science and technology is not family friendly. At the same time, gender equity in science and technology is important for development, as long has been recognized by the United Nations (UNCTAD 2011). Mainstreaming a gender perspective in Science, Technology and Innovation (STI) will both enhance social equity and bring significant benefits across the economic structure and social fabric; and contribute to the achievement of the Millennium Development Goals and the attainment of sustainable development.

2. LITERATURE REVIEW

In a study on Gender Bias in mathematics, science and technology (Strauss, 2002), found that the absence of equitable elementary and middle school science instruction that includes hands-on activities is a serious form of discrimination in the educational system. Similarly, Croxford, (2002) observed that one of the reasons why
young people, particularly females, opt out of science and technology is due largely to their perception. In a similar vein, Aguele, (2004) observed that the negative image of women towards STM has accounted largely for the low enrolment of females in these subjects particularly in the universities. He observed further that enrolment ratio of males to females in STM for the academic years 1993/94,1995/96,1996/97 and 1997/98 in some Nigerian Universities stood at 6:1, 3:1,3:2 and 3:1 respectively. Suter, (2006) points out that woman prefer careers that do not conflict with family responsibilities and are useful in childrearing, such as education, psychology, or medicine. Therefore, it seems that women do not consider ST Fields to be family-friendly (OECD, 2008). In addition, Xie,(2006) finds that it may be harder to combine family and work in some fields (e.g., those that demand many lab hours) than in other fields (e.g. Social sciences). Other authors note that women are drawn to fields that are more related to people than to numbers (OECD, 2008; Baker and Leary, 1995; Ceci and Williams, 2011). The family background and the absence of female role models can also influence women’s participation in ST careers (OECD 2008; Suter, 2006; Xie, 2006). argues that young people make career choices on the basis of adult workers’ experiences. When women become Successful in a field, the next generation is more likely to emulate their success. In addition, a woman’s family could influence her selection of a field of study. Suter, (2006) states that female students in engineering and other branches of science often have at least one parent with a profession in one of these disciplines. This clearly points to the importance of having a female role model working in a male-dominated profession or field of study. Coombs (cited in Aguele and Uhumuavbi,2003) observed that gender differentials in enrolment and achievement in higher education is invariably rooted in inequality at the primary and secondary levels where the real sorting out of University bound students take place. According to Coombs, female participation and interest in STM diminishes as they move up in the educational ladder towards the university level due to a variety of factors that are primarily rooted in their religious and cultural beliefs surrounding the role of women in the society. Research findings have indicated that gender differentials in higher education are invariably rooted in inequalities at the primary, and secondary levels where the real sorting out of university bound students takes place (Coombs, as cited in Aguele and Uhumuavbi, 2003). These inequalities includes traditional and religious beliefs, remoteness, poverty, child labor, social roles required for the different sexes, argument about biological built up of women and birth order. Some other factors that have been identified (Okeke, 1990; Obodo, 1993; Ifeluni. 1997) include lack of support from education policy makers, different socialization patterns for boys and girls at early stages of life, early marriages, and teachers ‘attitude to girls. It is a known fact in Africa that women used to be denied and deprived of many benefits (social and economical) which their male counterparts enjoyed. Such deprivation has also affected the status of girls and women in the society. The extent to which such deprivation has modified their mental Science, Technology and Mathematics (STM) are today known to be very central to the development of any nation. (Ukeje,(1997) observes that the development of a nation is properly accessed by the level of the education of its citizens in STM. Uhlig,(1999) also alluded to this view when he stated that: In the theory and policy of development it has been accepted from the beginning of the debate that one of the essential pre conditions for the development and transformation of a national economy is the factor of education in the broadest sense and science and technology in the particular sense. The implication of this is that to attain national development, it is not enough to educate the citizens in the broadest sense, but to give them sufficient education in Science and technology. This is so because Science and technology is considered as the vehicle for rapid development and economic transformation of a nation. Today, women constitute more than half of the world’s population (Commonwealth1999). Hence, we cannot afford to ignore them if we must attain meaningful development in our nation. Capacity may never be fully explicated (Aguele, 2004).

3. MATERIALS AND METHODS

Data Collection Method
Primary method of data collection was adopted in carrying out this research study. The surveyed data used was collected through structured questionnaire. The questionnaire was administered purposively to a sample of 300 female students in the school of management studies, Federal Polytechnic, Ilaro in order to know the causative factors and solution of low female gender participation in science and Technology based and career.
Method of Data Analysis

Descriptive and inferential Statistics method of data analysis was applied to scaled statements to examine the order of importance. Pictorial representation of scaled statements was done using bar chart. Factor analysis was adopted to extract the most prevalent impediments to low female participation in science and technology, thereby fitting Ordinary least square model to those important variables for test of significance.

4. Results and Discussion

Fig. 1: Distribution of participants Marital Status

Distribution of participants marital status showed that majority of them are single which accounts for 60% of the total sample selected, while 1% are the divorced depicting the minority. The married and separated participants were 32% and 7% of the total sample respectively.

Table 1: Perception of Participants on Female Gender Participation in ST

<table>
<thead>
<tr>
<th>S/N</th>
<th>ITEMS</th>
<th>SA</th>
<th>A</th>
<th>U</th>
<th>D</th>
<th>SD</th>
<th>WF</th>
<th>WA</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>There is low turnout of female students in science and technology courses in tertiary institutions</td>
<td>99</td>
<td>126</td>
<td>16</td>
<td>33</td>
<td>26</td>
<td>1139</td>
<td>3.80</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>There are challenges faced by females in science and Technology opportunities compared to their male counterpart</td>
<td>103</td>
<td>100</td>
<td>11</td>
<td>28</td>
<td>58</td>
<td>1062</td>
<td>3.54</td>
<td>A</td>
</tr>
</tbody>
</table>

Results presented as number of participants. Perception was scored by assigning 1 to SD, 2 to D, 3 to U, 4 to A, and 5 to SA. Reversed questions were coded otherwise.

Source: Researcher’s Self Computation

Perception of participants on female gender participants in science and technology can be depicted in table 1. Item one showed that participants Opined that female’s turnout in science and technology is low due to the challenges faced by in Science and Technology opportunities compared to their male counterparts.

Fig. II: Multiple Bar Charts showing Distribution of Participants on Socialization as impediments to low female gender participation

Mean of 3.64 in figure 2 indicates that socialization such as gender inequality, influence of peer groups, discouraging school curriculum, and culture of marginalization is an impediments to low female gender participation in Science and Technology.
Pictorial representation of figure III showed that majority of the respondents agreed on a weighed score of 3.71 that cognitive ability of female participants taking low intelligent quotient, poor foundation in mathematics, and not meting up with course requirements into consideration impede low female participation in science and technology.

Table 11: Impediments to Female Participation in Science and Technology Based on factor loadings

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Communalities</th>
<th>Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
<td>Cumulative %</td>
</tr>
<tr>
<td>1</td>
<td>1.702</td>
<td>24.318</td>
<td>24.318</td>
</tr>
<tr>
<td>2</td>
<td>1.407</td>
<td>20.098</td>
<td>44.415</td>
</tr>
<tr>
<td>3</td>
<td>1.125</td>
<td>16.064</td>
<td>60.480</td>
</tr>
<tr>
<td>4</td>
<td>1.019</td>
<td>14.534</td>
<td>75.034</td>
</tr>
<tr>
<td>5</td>
<td>.718</td>
<td>10.253</td>
<td>85.287</td>
</tr>
<tr>
<td>6</td>
<td>.569</td>
<td>8.131</td>
<td>93.417</td>
</tr>
<tr>
<td>7</td>
<td>.461</td>
<td>6.583</td>
<td>100.000</td>
</tr>
</tbody>
</table>

PGI = Peer Group Influence; DSC = Discouraging School Curriculum; GE=No Gender Equality; NMCR=Not meeting up with course requirements
PFM = Poor foundation in mathematics; COM=Culture of Marginalization; LIQ=Low Intelligent Quotient

Factor loadings of table II showed that out of the seven factors contributing to low female participations in Science and Technology, only four were of high importance based on the initial eigen values >1 and higher extracted communalities of 0.866, 0.827, 0.811, and 0.733 for factors of Peer Group Influence, Discouraging School Curriculum, Culture of Marginalization and Poor Foundation in Mathematics which contribute to 75.03% of the total percentage variance.

Generally we are interested in keeping only those principal components with Eigen values greater than one based on significance of Kaiser Criterion (Kaiser, 1960). Other factors such as; “No Gender Equality”, “Low Intelligent Quotient”, and “Not meeting up with Course requirements” were found also found to be fundamental structure of barriers but contributed to only 24.96% to the menace under study .

The extracted impediments were used to confirm the significant their effects of female gender interest on science and technology as evidenced from table 2.

Table III: Regression Analysis

<table>
<thead>
<tr>
<th>Model</th>
<th>Coefficients</th>
<th>t-stat.</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>1.439</td>
<td>.422</td>
<td>3.411</td>
</tr>
<tr>
<td>PGI</td>
<td>.360</td>
<td>.047</td>
<td>7.693</td>
</tr>
<tr>
<td>DSC</td>
<td>.176</td>
<td>.057</td>
<td>3.089</td>
</tr>
<tr>
<td>COM</td>
<td>-.078</td>
<td>.066</td>
<td>-1.181</td>
</tr>
<tr>
<td>PFM</td>
<td>.171</td>
<td>.074</td>
<td>2.313</td>
</tr>
</tbody>
</table>

R = 0.789; R² = 0.623; Adj. R² = 0.619; F-statistic = 23.135 (P-value = 0.000);

Dependent: Low Participation (LP)
Source: Extracted from SPSS, Version 20.
The model specification of table 3 is written as:

\[ LP = \beta_0 + \beta_1(PGI) + \beta_2(DSC) + \beta_3(COM) + \beta_4(PFM) + \varepsilon_i \]  
(1)

Where:

\[ LP = 1.439 + 0.360(PGI) + 0.176(DSC) - 0.078(COM) + 1.71(PFM) \]  
(2)

The model specified from table 3 above is given by equation (1) with the substituted coefficients in equation (2). This model gives a reasonable projection of low participation in science and technology for a unit increase in “Peer Group Influence”, “Discouraging School Curriculum”, and “Poor Foundation in Mathematics”, which is statistically significant based on the computed ‘t’(7.693, 3.089, 2.313) values. In fact, the relationships exhibited by the predictor measure of “Low Participation” is in line with prior expectations as analyzed impediments are expected to have impacted positively as exhibited in the estimates. However, its coefficient of determination \( R^2 = 0.623 \) implies that 62.3% of the variation in measure of female gender “Low participation in science and technology is accounted for by PG1, DSC, COM and PFM respectively. This model also clearly shows that the model is adjudged a best fit as confirmed from the F=23.135 (df = 4, 294) P-value < 0.05 significance value. In addition, coefficient of “Culture of Marginalization” (-0.078) does not contribute significantly (t = -1.181, P-value > α = 0.05 level of significance) to the model. The non-significance of the coefficient might be as a result of the opinion raised by the respondents’ on whether culture of marginalization is an impediment or not and was also negatively inclined. This resulted on the fact that opinion raised on culture of marginalization varies from participants to participants taking the area from which the study was conducted into consideration.

![Fig IV: Multiple Bar Charts showing Distribution of Participants on solution to turnout of female gender participation in ST](image)

**Solution to turnout of female gender participation in ST**

However, empirical analysis of this research study indicates that awards of scholarships to females in Science Technology education to motivate others, giving career talks by successful females in Science and Technology fields, use of latest strategies such as ICT in the teaching of Science and Technology courses and encouraging gender equality in job placements as opined by the respondents in figure 4 will alleviate the low turnout of females in Science and Technology as this will increase the image of technology advancement in Nigeria.

5. **CONCLUSION**

The result of the study suggests that Peer Group Influence, Discouraging School Curriculum, Culture of Marginalization and Poor Foundation in Mathematics are issues in the participation of female genders in Science and Technology Education. The motivating factors for the increase of female genders from the respondents was awards of scholarship to females in Science and Technology education to motivate others, giving career talks by successful Females in Science and Technology fields, use of latest strategies such as ICT in teaching of Science and Technology courses and encouraging gender equality in job placements will alleviate the low turnout of females in Science and Technology as this will increase the image of technology advancement in Nigeria.
advancement in Nigeria. The study recommends that the society should be enlightened on the need to change attitude to gender roles.

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NUTRITIONAL STATUS AND PREVALENCE OF TYPE II DIABETES MELLITUS AMONG ELDERLY RESIDING IN ILARO, OGUN STATE, NIGERIA

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ABSTRACT
Diabetes mellitus is a public health problem and a global health threat which scientifi
c evidence has indicated individual’s nutritional status as one of its contributing fac
tors. Critical assessment of this contributing factor will help in reducing its prevalence. The study assessed the nutritional status and prevalence of diabetes among the elderly residing in Ilaro. It was descriptive and cross-sectional in design involving two hundred and fifty (250) elderly people. A semi-structured and interviewer administered questionnaire was used to obtained data on socio-demographic characteristics. Anthropometric measurements (weight (kg) and height (m)) were taken, body mass index (BMI (kg/m²)) was calculated and nutritional status indices were classified using World Health Organization (WHO) standards. Blood glucose test was carried out using Glucometer. Data were analyzed using SPSS. V.20.0. Majority of the respondents were females (59.6%), between 60-64 years (42.4%), practice Christian religion (64.8%) and belong to Yoruba ethnic group (94.8%). Anthropometric measurement shows that 56.8% of the respondents have normal BMI while 22.8%, 10.0% and 10.4% were overweight, obese and underweight respectively. Random blood glucose test reveals that 8.0% were diabetic, 3.0% were pre-diabetic while 16.0% and 73.0% have low and normal blood glucose levels respectively. Significant association (p < 0.05) was observed between nutritional status and some of the socio-demographic characteristics of the respondents. Also, blood glucose range was found to be significantly associated (p < 0.05) with the nutritional status of the respondents. In conclusion high prevalence of diabetes mellitus as well as overweight which co-exist with underweight was observed among the elderly sampled, thus nutrition intervention targeted at the care of the elderly is recommended.

Keywords: Diabetes mellitus, Nutritional status, Prevalence, Elderly.

1.0 INTRODUCTION
The United Nations defined elderly as people between age 60 years and above (WHO, 2003). This group of people are usually referred to as vulnerable group because they have been found to be vulnerable to health related predicaments associated with factors like aging, poor socio-economic status, poor eating pattern, under nutrition, over-nutrition, chronic illness and diseases (WFP, 2009). The aged appears to be more vulnerable than the younger age groups due to problems relating to ignorance on appropriate food choices, loneliness, social isolation which often times lead to depression, apathy, lack of appetite, physical disabilities, cardiovascular problems and poverty among others.

Malnutrition among this group of people is a great hazard and this has been attributed to their vulnerability. Though the etiology of type 2 diabetes mellitus complications is poorly understood, but nutritional status and dietary pattern have been identified as one of the major lifestyle factors that may play an important role in preventing and managing this condition (ADA, 2002, Mirmiran et al., 2014).

According to America Diabetes Association (ADA, 2008), diabetes is a disease caused by diminished insulin excretion or diminished insulin action, or both. It is a metabolic disease characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both due to destruction and loss of the β-cells of the pancreas or abnormalities arising from resistance to insulin (ADA, 2014). Diabetes mellitus is a non-communicable disease associated with long term complications to the brain, kidney, and the heart. Its major symptoms include polydipsia, polyphagia polyuria, blurred vision, weight loss, neuropathy, retinopathy, etc. Life threatening consequences of uncontrolled diabetes mellitus include diabetes-ketoadiosis, lactic acidosis and hyper-osmolar non-ketotic state (Diabetes Care, 2006). Diabetes mellitus is recognized as an important cause of premature death and disability; it is one of four priority non-communicable diseases targeted by world leaders (WHO, 2014). The burden of diabetes mellitus is higher among the older population and associated with more clinical complications than in younger people.
Globally, the prevalence of diabetes mellitus (DM) is steadily increasing most especially in the world’s low and middle-income countries (WHO, 2016). World Health Organization estimates that, 422 million adults were living with DM in 2014, and projects that DM will be the seventh leading cause of death in 2030 (WHO, 2016) due to population growth, ageing, unhealthy diets, obesity and sedentary lifestyles. In Africa, over 5 million people suffer from the disease and the number is expected to skyrocket to 15 million by 2025 (IDF, 2006), this will undoubtedly pose serious health and economic problems on the African community. In Nigeria, Akinkugbe et al. (2007) found that the National prevalence of diabetes was 2.2%, with a male: female ratio of 1:1, and a significant increase in prevalence with age. This was found to increase to 5.0% in 2013 by International Diabetes Federation (IDF, 2013). In south east Nigerian, Chris et al. (2012) reported that the overall prevalence of diabetes was 10.51%. Olatunbosun et al. (1996) reported a prevalence of 0.8% of diabetes mellitus and 2.2% of Impaired Glucose Intolerance in Ibadan with a slight increase to 2.8% as reported by Owoaje et al. (2007) who reported a prevalence of 2.8% in an adult population in Ibadan. In Port Harcourt, the prevalence was 6.8%, with the male-female ratio of 1.4:1 (Ebenezer et al., 2003).

As a result of poor economic situation of Nigeria, poverty, as well as lack of adequate access to health care, many cases of diabetes are undiagnosed (Rasaki et al., 2017) and give credence to rule of Halves (Hart, 1992) which states that: half of the people living with diabetes have been diagnosed, half of those diagnosed received professional care and of those receiving care, only half achieve their treatment goals. Of those achieving treatment targets, half are free from diabetes complications.

Ilaro in Yewa South Local Government area of Ogun state has a dietary and a socio-cultural identity. They are known to consume a lot of carbohydrate (cassava and maize based food; fufu, lafun, eba, eko, kokoro etc.) diet which predisposed them and make them prone to having diabetes mellitus. There is no record of prevalence of DM and pre-diabetes in the area, even though, the disease is common among the people which necessitate the need for this study. This study was designed to access the dietary pattern and prevalence of diabetes and pre-diabetes in Ilaro community, Yewa South Local Government, Ogun state.

2.0 MATERIALS AND METHOD
The study area
The study was conducted in Ilaro town; the capital of Yewa South Local Government, Ogun state, Nigeria. Ilaro town is about 50 km from Abeokuta, the Ogun State capital and about 100 km from Ikeja, the capital city of Lagos State. Ilaro is situated on the rich cocoa belt of South Western region of Nigeria and endowed naturally with an expanse of land measuring about 168,750 hectares and a population of 168,850 according to the 2006 provisional census. The inhabitants of Yewa South are mainly Yoruba speaking with various dialects like Yewa, Anago, and Egun, while the three main religions are Christianity, Islam and Traditional.

Study design
The study was cross-sectional and descriptive in nature. It involves 250 apparently healthy, free- living and non-institutionalized elderly residing in the selected communities in Ilaro.

Sample technique
Multi-stage sampling procedure was used in selecting the respondents, which involves purposive selection. Ilaro is made up of three wards, which are Ilaro I, Ilaro II and Ilaro III; each of the wards is made up of more than ten communities. Five communities were randomly selected from each ward. Household listing was done for all the household with at least one elderly male or female and the respondents were selected systematically using a regular interval. Simple balloting was used in selecting respondents from the household with more than one elderly.

Ethical clearance and consent
Letter of introduction was obtained from the Department of Nutrition and Dietetics, Federal Polytechnic of Ilaro, Ogun State and addressed to the Nutritionist of Yewa South Local Government. An ethical approval was obtained from the Medical Officer of Health (MOH) of the Local Government. Subjects were duly informed and written consent was also obtained from the participants before taking part in the study. Caregiver, children or relatives of the illiterate subjects were also informed before data collection.

Data collection
A semi-structured and interviewer-administered questionnaire was used in assessing the socio-economic and demographic characteristics of the respondents. The nutritional status was assessed using anthropometric measurement method (height and weight). The weight was measured while standing with both arms by the side
and with only light clothing. The pointer of the weighing scale was adjusted to zero before each weighing and recorded to the nearest kilogram. In measuring the height of the respondents, a locally constructed but standardized height meter was placed behind the heels of each subject and the height was measured while standing with the head fixed against the height meter and the level just above the hair marked and recorded to the nearest meter. Using their weight and height, body mass index (BMI) was calculated and nutritional status indices were classified using World Health Organization (WHO) standards.

Blood glucose level measurement
The Random Blood Glucose (RBG) level of the respondents was determined using a glucometer and the values obtained were classified as Normal (79- 1509mg/dL, i.e. 4.4-8.9mmol/l), Pre-diabetes (160-200mg/dL i.e. 8.9 mmol/L - 11.1mmol/L), Hypoglycemia and Diabetes ≥200mg/dl) (ADA. 2014.).

3.0 DATA ANALYSIS
Data obtained from the study was subjected to both descriptive and inferential statistics. Descriptive statistics like; Percentage, Frequency and Standard deviation was used while inferential statistics; chi-square test and analysis of variance (ANOVA) and Pearson correlation was also used to test for significant relationship and differences between the variables respectively. Data were analyzed using statistical packages for social sciences (SPSS version 20.0 software computer program).

4.0 RESULTS AND DISCUSSIONS
4.1 Results
Table 1 shows the socio-demographic characteristics of the respondents. More than half of the respondents (59.6%) were male while 40.4% were female. The age assessment determined chronologically reveals that majority of the respondents (42.4%) were between the age brackets of 60-64, 20.8% were between 65-69 years, 17.2% were between 70-74 years, 4.4% were between 75-79 years, 8.0% were between 80-84 years, 2.0% were between 85- 86 and 5.2% were above 90 years. Majority of the subjects (94.8%) were Yoruba while others were Igbo (2.0%), Hausa (1.2%), French (0.4%) and Egun (1.6%). More than half of the respondents practice Christian religion (64.8%), while 33.6% practices Islamic religion and 1.6% practices traditional religion. About 53% of the respondents were still living with their spouse, while almost half of the respondents were single, either as a result of divorce (8.0%) or death of spouse, widow (31.2), widower (7.2%) and few (0.8%) of the respondents were never married before. Also, almost half (45.2%) of the respondents were not educated, i.e. have no formal education and earn less than ₦10,000 monthly.

Table 1: Socio-demographic characteristics of the respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>101</td>
<td>40.4</td>
</tr>
<tr>
<td>Female</td>
<td>149</td>
<td>59.6</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-64</td>
<td>106</td>
<td>42.4</td>
</tr>
<tr>
<td>65-69</td>
<td>52</td>
<td>20.8</td>
</tr>
<tr>
<td>70-74</td>
<td>43</td>
<td>17.2</td>
</tr>
<tr>
<td>75-79</td>
<td>11</td>
<td>4.4</td>
</tr>
<tr>
<td>80-84</td>
<td>20</td>
<td>8.0</td>
</tr>
<tr>
<td>85-89</td>
<td>5</td>
<td>2.0</td>
</tr>
<tr>
<td>90 and above</td>
<td>13</td>
<td>5.2</td>
</tr>
<tr>
<td>Ethnic group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yoruba</td>
<td>237</td>
<td>94.8</td>
</tr>
<tr>
<td>Igbo</td>
<td>5</td>
<td>2.0</td>
</tr>
<tr>
<td>Hausa</td>
<td>3</td>
<td>1.2</td>
</tr>
<tr>
<td>French</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Egun</td>
<td>4</td>
<td>1.6</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christianity</td>
<td>162</td>
<td>64.8</td>
</tr>
<tr>
<td>Islam</td>
<td>84</td>
<td>33.6</td>
</tr>
<tr>
<td>Traditional</td>
<td>4</td>
<td>1.6</td>
</tr>
</tbody>
</table>
Marital status

<table>
<thead>
<tr>
<th>Status</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Married</td>
<td>132</td>
<td>52.8</td>
</tr>
<tr>
<td>Divorced</td>
<td>20</td>
<td>8.0</td>
</tr>
<tr>
<td>Widow</td>
<td>78</td>
<td>31.2</td>
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<tr>
<td>Widower</td>
<td>18</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Educational level

<table>
<thead>
<tr>
<th>Level</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No education</td>
<td>113</td>
<td>45.2</td>
</tr>
<tr>
<td>Primary education</td>
<td>74</td>
<td>29.6</td>
</tr>
<tr>
<td>Secondary education</td>
<td>29</td>
<td>11.6</td>
</tr>
<tr>
<td>NCE/OND</td>
<td>20</td>
<td>8.0</td>
</tr>
<tr>
<td>HND/B.Sc.</td>
<td>13</td>
<td>5.2</td>
</tr>
<tr>
<td>Standard six</td>
<td>1</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Present occupation

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retired</td>
<td>48</td>
<td>19.2</td>
</tr>
<tr>
<td>Self employed</td>
<td>26</td>
<td>10.4</td>
</tr>
<tr>
<td>Farming</td>
<td>29</td>
<td>11.6</td>
</tr>
<tr>
<td>Civil servant</td>
<td>8</td>
<td>3.2</td>
</tr>
<tr>
<td>Petty trading</td>
<td>54</td>
<td>21.6</td>
</tr>
<tr>
<td>Employee of private organization</td>
<td>15</td>
<td>6.0</td>
</tr>
<tr>
<td>Personal business</td>
<td>56</td>
<td>22.4</td>
</tr>
<tr>
<td>Can no longer work for money</td>
<td>13</td>
<td>5.2</td>
</tr>
<tr>
<td>Prophet</td>
<td>1</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Previous occupation

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self employed</td>
<td>30</td>
<td>12.0</td>
</tr>
<tr>
<td>Farming</td>
<td>31</td>
<td>12.4</td>
</tr>
<tr>
<td>Civil servant</td>
<td>44</td>
<td>17.6</td>
</tr>
<tr>
<td>Petty trading</td>
<td>52</td>
<td>20.8</td>
</tr>
<tr>
<td>Employee of private organization</td>
<td>21</td>
<td>8.4</td>
</tr>
<tr>
<td>Personal business</td>
<td>72</td>
<td>28.8</td>
</tr>
</tbody>
</table>

Estimated monthly income

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10,000</td>
<td>125</td>
<td>50.0</td>
</tr>
<tr>
<td>11,000-30,000</td>
<td>79</td>
<td>31.6</td>
</tr>
<tr>
<td>31,000-50,000</td>
<td>19</td>
<td>7.6</td>
</tr>
<tr>
<td>51,000-70,000</td>
<td>14</td>
<td>5.6</td>
</tr>
<tr>
<td>71,000 and above</td>
<td>13</td>
<td>5.2</td>
</tr>
</tbody>
</table>

In assessing the nutritional status of the selected elderly, anthropometric (height and weight) measurement was done. Male respondents were found to be significantly taller (p<0.05) than the female respondents with the mean height 1.68±0.06 and 1.59±0.06 respectively. The mean weight of the male respondents (64.26±10.60) was also found to be greater than that of the female (62.91±14.67) respondents but the differences was not significant (p>0.05). On the contrary, the mean Body Mass Index{BMI (kg/m$^2$)} of the female respondents was found to higher than that of male respondents but the differences were not significant (p>0.05) as presented in table 2.

Table 2: Anthropometry measurement of the respondent

<table>
<thead>
<tr>
<th>Sex</th>
<th>Height(m)</th>
<th>Weight(kg)</th>
<th>BMI(kg/m$^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1.68±0.06</td>
<td>64.26±10.60</td>
<td>22.96±3.56</td>
</tr>
<tr>
<td>Female</td>
<td>1.59±0.06</td>
<td>62.91±14.67</td>
<td>25.97±14.40</td>
</tr>
<tr>
<td>F</td>
<td>125.57</td>
<td>0.633</td>
<td>4.25</td>
</tr>
<tr>
<td>p-value</td>
<td>0.00*</td>
<td>0.43</td>
<td>0.40</td>
</tr>
</tbody>
</table>

*Statistical significant at p ≤ 0.05

Furthermore, figure 1 shows the nutritional status of the respondents. Majority of the respondents (56.8%) i.e. 27.2% male and 29.6% female were normal, 10.6% were underweight (4.40% male and 6.0% female), 22.8% were overweight ( 7.60% male and 15.2% female) and 10% (1.2% male and 8.80 female) were obese. Prevalence of over nutrition and under-nutrition was more pronounced among the female respondents.
As presented in Table 3, significant association (p < 0.05) was observed between the nutritional status of the respondents and the socio-demographic and economic characteristics like; gender, present occupations and previous occupations. No significant association (p > 0.05) was observed between the nutritional status and other socio-demographic and economic characteristics of the respondents.

The present study also sought to assess the prevalence of type II diabetes mellitus among the selected elderly. The Fasting Blood Glucose (FBG) level of the respondents was determined and the values obtained were classified as Normal (79 - 150mg/dL, i.e. 4.4 - 8.9mmol/L), Pre-diabetes (160-200mg/dL i.e. 8.9 mmol/L - 11.1mmol/L), Hypoglycemia and Diabetes ≥200mg/dl) (ADA, 2014). Less than one quarter (16%) of the respondents have low blood glucose level (hypoglycemia), 3% were pre-diabetic, majority (73%) have normal blood glucose level and 8% of the respondents were diabetic.

![Figure 1: nutritional status of the respondents](image)

Table 3: Socio-demographic characteristics and nutritional status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Normal</th>
<th>Underweight</th>
<th>Overweight</th>
<th>Obese</th>
<th>$\chi^2$</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>68(27.2)</td>
<td>11(4.4)</td>
<td>19(7.6)</td>
<td>3(1.2)</td>
<td>12.902</td>
<td>0.005*</td>
</tr>
<tr>
<td>Female</td>
<td>74(29.6)</td>
<td>15(6.0)</td>
<td>38(15.2)</td>
<td>22(8.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-64</td>
<td>56(22.4)</td>
<td>10(4.0)</td>
<td>25(10.0)</td>
<td>15(6.0)</td>
<td>27.95</td>
<td>0.063</td>
</tr>
<tr>
<td>65-69</td>
<td>35(14.0)</td>
<td>1(0.4)</td>
<td>13(5.2)</td>
<td>3(1.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70-74</td>
<td>25(10.0)</td>
<td>2(0.8)</td>
<td>12(4.8)</td>
<td>4(1.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75-79</td>
<td>5(2.0)</td>
<td>3(1.2)</td>
<td>2(0.8)</td>
<td>1(0.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80-84</td>
<td>11(4.4)</td>
<td>4(1.6)</td>
<td>4(1.6)</td>
<td>1(0.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85-89</td>
<td>3(1.2)</td>
<td>2(0.8)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90 and above</td>
<td>7(2.8)</td>
<td>4(1.6)</td>
<td>1(0.4)</td>
<td>1(0.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnic group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yoruba</td>
<td>132(52.8)</td>
<td>26(10.4)</td>
<td>54(21.6)</td>
<td>25(10.0)</td>
<td>8.945</td>
<td>0.708</td>
</tr>
<tr>
<td>Igbo</td>
<td>4(1.6)</td>
<td>0(0.0)</td>
<td>1(0.4)</td>
<td>0(0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hausa</td>
<td>1(0.4)</td>
<td>0(0.0)</td>
<td>2(0.8)</td>
<td>0(0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French</td>
<td>1(0.4)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egun</td>
<td>4(1.6)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christianity</td>
<td>98(39.2)</td>
<td>17(6.8)</td>
<td>32(12.8)</td>
<td>15(6.0)</td>
<td>8.649</td>
<td>0.194</td>
</tr>
<tr>
<td>Islam</td>
<td>43(17.2)</td>
<td>9(3.6)</td>
<td>22(8.8)</td>
<td>10(4.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional</td>
<td>1(0.4)</td>
<td>0(0.0)</td>
<td>3(1.2)</td>
<td>0(0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monogamy</td>
<td>82(32.8)</td>
<td>11(4.4)</td>
<td>23(9.2)</td>
<td>13(5.2)</td>
<td>5.937</td>
<td>0.115</td>
</tr>
</tbody>
</table>

1st National Conference of WITED, Ilaro Chapter
Table 4 shows the association between the nutritional status and the blood glucose level of the respondents. Significant association \((p < 0.05)\) was observed between the nutritional status of the respondents and their blood glucose level. Highest \((14\%)\) prevalence of diabetes was found among the overweight respondents followed by obese respondents \((12\%)\).

![Figure 2: Percentage distribution of blood glucose level](image)

---

*Statistically significant \((p \leq 0.05)\), Figures in parenthesis denote percentages.
Table 4: Nutritional status and blood glucose level of the respondents

<table>
<thead>
<tr>
<th>Nutritional status</th>
<th>Blood glucose level categories</th>
<th>X²</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Normal</td>
<td>106(74.6)</td>
<td>4(2.8)</td>
</tr>
<tr>
<td>Underweight</td>
<td>Pre-diabetes</td>
<td>15(57.7)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>Overweight</td>
<td>Hypoglycemia</td>
<td>40(70.2)</td>
<td>4(7.0)</td>
</tr>
<tr>
<td>Obese</td>
<td>Diabetes</td>
<td>21(84.0)</td>
<td>1(0.4)</td>
</tr>
</tbody>
</table>

*Statistically significant (p ≤ 0.05), Figures in parenthesis denote percentage within the group.

Table 5 shows the association between age, blood glucose value and the weight of the respondents. A very week negative correlation was observed between the age and the blood glucose value of the respondents as well as age and height of the respondents. Also a positive correlation was observed between blood glucose value and the height of the respondents and a strong negative correlation was observed between the weight and age of the respondents. Lastly, a stronger and positive correlation was observed between the weight and blood glucose value of the respondents. This result thus seems to suggest that, the weight of an individual can positively affect the blood glucose level.

**Correlation is significant at the 0.01 level (2-tailed).**

4.2 DISCUSSION

The study aimed at assessing the nutritional status and prevalence of diabetes mellitus among the elderly residing in Ilaro community, Yewa South Local Government area, Ogun State. Majority of the subjects studied were female between the age bracket of 60 and 64 years with no formal education, engage in petty trading or self-employed and with estimated monthly income that is less than ₦10,000. The socio-demographic characteristics and economic status observed in this study is similar to that observed by Adepoju et al. (2018) in a similar study conducted in the same community as well as that of Olayiwola et al. (2006) and Afolabi et al. (2012) in a similar study conducted in Ibadan. This low socio economic status will greatly affect their quality of life as well as access to basic needs.

High prevalence of malnutrition -overweight and underweight- was discovered among almost half of the respondents; more than 10% of them were underweight, 22.8% were overweight and 10% were obese. This finding is in agreement with that of Nancy et al. (2008) in which prevalence of obesity was found to have increased in all ages and older adults are not exempted. This implies that elderly in the study community need nutritional based programme targeted at reducing the prevalence of malnutrition among them. Moreover, nutritional status was found to be significantly associated with some socio-demographic and economic characteristics like gender, present and previous occupation. This agrees with the study of Adepoju et al. (2018) and Olayiwola et al. (2006).

The present study also assessed the blood glucose level of the respondents. The prevalence of diabetes mellitus and pre-diabetes mellitus was found to be 8% and 3% respectively. These values is slightly higher than that of Rasaki et al. (2017) in a similar study conducted among the indigenes of Oke- Ogun geo-political zone of Oyo State as well as that of Lucia et al. (2012) and Sonny et al. (2011). The prevalence was higher than 0.6%
reported by Chineny et al., (2012) in Port-Harcourt, 0.8% by Olatunbosun et al., (1998) in Ibadan and 2.2% in Port-Harcourt by Nyewen et al., (2003). The fact that this study was not a hospital based study; and also that it made use of random blood glucose level measurement in its diagnosis may explain the difference in the prevalence of diabetes mellitus compared with other studies. Though various methods have been used by various researchers in diagnosing diabetes mellitus, Akinkugbe et al. (1969) included presence of glycosuria in his diagnoses. Similarly, Johnson (1969) used urinalysis as the method of detection and diagnosis of diabetes mellitus, Erasmus study (1989) in Ilorin based his study on the WHO 1980 criteria and Ohwovoriole et al., (1988) in Lagos made use of random blood sugar levels.

Moreover, significant association was observed between the blood glucose levels and the nutritional status of the respondents. Highest (14%) prevalence of diabetes was found among the overweight respondents followed by obese respondents (12%) and a stronger positive correlation was observed between the weight of the respondents and their blood glucose level. This affirmed the declaration of World Health Organization that an increase in body fat is generally associated with an increase in risk of metabolic diseases such as type 2 diabetes mellitus, hypertension and dyslipidaemia.

5.0 CONCLUSION AND RECOMMENDATIONS

High prevalence of diabetes mellitus as well as overweight which co-exist with underweight was observed among the elderly sampled, thus nutrition intervention targeted at the care of the elderly is recommended. Also, there is need to enlighten the people about diabetes and its attendant complications.

REFERENCE


America Diabetes Association (2014). Diagnosing diabetes and learning about Pre-diabetes

http://www.diabetes.org/are-you-at-risk/prediabetes/?loc=superfooter


IMPACTS OF TECHNOLOGY INNOVATIONS AND ENTREPRENEURSHIP TRAINING ON SME PERFORMANCE IN NIGERIA

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ABSTRACT
High youth unemployment and very high foreign exchange rates are the problems that Nigeria is currently faced with. Therefore, there is the urgent need for diversification and revamping of the economy. Small and medium enterprises (SMEs) are thus an important tool to achieve this. How therefore can acquisition of entrepreneurship training and adoption of technology enhance performance of SMEs, bring about economic recovery, and thus help to reduce the economic challenges. The instrument consisted of twenty items on a five-point Likert rating scale, which was administered on one hundred owners of manufacturing SMEs sampled using cluster, proportionate and random sampling procedures from some selected businesses across Sango Area of Ogun State. The results indicated that acquisition of entrepreneurship training and adoption of technology devices and platforms enhance productivity and profitability of SMEs in Nigeria. It is concluded that for manufacturing SMEs to operate competitively, profitably and significantly contribute to the economic growth of Nigeria, they need to continuously acquire newer entrepreneurial training; adopt and use innovative modern technologies.

Keywords: Entrepreneurial skills, adoption and use of technology, SMEs performance, competitive advantage, Nigeria

1. INTRODUCTION
The necessity for economic growth has made SMEs’ important roles to be acknowledged in many nations. Therefore, Their values, such as power of expansion, Job creations at relatively low capital cost, means of livelihood, provision and development of trained and untrained labor for potential industrial growth and the breeding ground for managerial and entrepreneurial talents have shown SMEs as indispensable sector in any economy (Ayanda & Laraba, 2011,Agwu, 2014; Okpara, 2011). However, SMEs in Nigeria face monumental challenges such as weak strategic orientations, poor infrastructure, inadequate capabilities, poor management and inadequate technological skills’ development and lack of export market knowledge/experience (Adegbite, Ilori, Irefin, Abereijo, & Aderemi, 2007,Agwu, 2014; Okpara, 2011).

These challenges are aggravated by a lack of adequate commitment and policy interventions of government to fix key infrastructures and support diffusion of technological innovations among firms. Given the amount of environmental turbulence and the near absence of institutional support and policy incentives, many African firms struggle to survive, and surviving firms often struggle to grow (for studies on African firms, see Egbetokun et al., 2008; Oyelaran-Oyeyinka and McComick, 2007). Cooperation activities provide firms with access to complimentary technological resources (De Faria et al., 2010) and also enable cost sharing, risk reduction and flexibility in the drive for value creation (Lavie, 2007). These network activities can take the form of informal linkages aimed at specific needs or short-term goals (Lavie, 2007; Mancinelli and Mazzanti, 2009), or formal alliances aimed at long-term objectives (Holmen et al., 2005; Schilling and Phelps, 2007).

Given the peculiar challenges connected with the African context, it is important to fill the gap in empirical data about the impact of technological transfer among SMEs in Sub-Saharan Africa. Nigeria presents an archetypical context to examine the coping strategies of African firms with regard to technological innovation and small business performance in a challenging environment.
First, Nigeria is the most populous nation in Africa, and it is also one of Africa’s biggest economies. Furthermore, it is also a window to Africa’s ethnic and cultural diversity, with more than 300 language groups spread across the country’s various geo-political zones.

In particular, the paper focuses on two research questions:

RQ1. Do technological innovations drive firm performance?

RQ2. Does entrepreneurship training enhance SMEs Performance?

In order to answer these questions, this study draws from a random survey of 100 Nigerian firms to illuminate the effectiveness or otherwise of technological innovations and entrepreneurship training.

2. LITERATURE REVIEW

2.1 Technology innovations and performance of SMEs in Nigeria

Information communication technology (ICT) refers to the technology systems used to transmit, store, process, display, create, and automate information dissemination (Gunday, Ulusoy, Kilic, & Alpkan, 2011; Modimogale & Kroez, 2011). These technologies include items such as television; fixed telephone lines; mobile phones; radio; satellite systems; video; computers; network software and hardware; and the equipment and services related to these technologies, such as emails, video-conferencing, blogs, and social media (Ali, Jabeen, & Nikhitha, 2016). Technology innovation is the systematic application of all sources of organized knowledge, such as literature, science, and the arts, geared toward organizational performance (Luppici, 2005). Also, technological innovation contributes to firm performance through increase in labour productivity (Cainelli et al., 2004; Jones and Corral de Zubielqui, 2017), improved resource efficiency (Adams and Comber, 2013) and increased sales and profit through access to new markets (Bhaskaran, 2006). For small firms, in particular, the propensity to innovate may take on an even greater significance for firm performance and competitiveness (Rhee et al., 2010). In other words, smaller firms can make up for their resource constraints and disadvantage relative to large firms by focusing more on innovative activities, and leveraging their flexibility and proximity to the market for superior business performance (Batra et al., 2015). However, because the contributions of technological innovations to productivity often take size, larger firms tend to have the advantage in terms of their resource capability to adopt and implement them (Abor and Quartey, 2010). The findings from this study contribute to the knowledge base regarding factors that affect ICT adoption by SME leaders as a business strategy to increase profitability, but the reality is that unreliable power supply limited and expensive Internet service, unreliable and expensive telecommunications, bad roads and other infrastructural services are not readily available in Nigeria are still influencing the SMEs decision to adopt technology. The leaders of many SMEs must provide the infrastructural services if they need to succeed, so they have limited resources left to invest in ICT. (Okundaye, Susan K. Fan and Dwyer, 2018). However, this scenario has created problems to many SMEs to survive.

2.2 Entrepreneurial training and performance of SMEs in Nigeria

Different countries define SMEs differently depending on their stage of economic growth (Berisha & Pula, 2015). The accepted principles for the definition of SMEs comprise staff numbers, investment level, and sales volume (European-Union, 2005). The European Commission defines SMEs as firms with 10 to 49 employees and medium-sized businesses as those with between 50 and 250 employees (Katua, 2014). Scholars have defined rural SMEs as those enterprises working within the agricultural value chain (Eskesen, Agrawal, & Desai, 2014). These include individual farmers, producers, service providers, and intermediaries. Nigeria is an archetypal context for a study of African firms. With an estimated population of 186 million (United Nations, 2016), it is Africa’s most populous nation. It is also reputed to be one of African’s largest economies. According to the recent available statistics, about 71 per cent of the population are reported to be living in relative poverty, and poverty rate has been put at 64.2 per cent in 2013/2014, increasing from 62 per cent in 2010 (World Bank, 2013). Moreover, the official unemployment rate increased from 11 per cent in 2006 to 24 per cent in 2011, and a great number of those employed are under-employed (Rogers, 2012). According to a 2014 report, the number of workers in vulnerable employment was very high at 77 per cent in 2012, and labour productivity remains very low (International Labour Organization, 2014). Small- and medium-scale enterprises, which constitute more than 90 per cent of businesses in Nigeria (The Economist Intelligence Unit, 2015), are considered critical for the country’s goals of sustainable growth, poverty reduction and job creation. The Nigerian Federal Government reports that 17,284,671 micro-, small- and medium-scale enterprises in Nigeria, with the vast
majority of them classed as micro enterprises. Together they contribute about 75 per cent of employment, and about 40 per cent of the country’s GDP (Federal Government of Nigeria, 2013). While, there is no single universally accepted definition of small- and medium-scale enterprises (SMEs), most definitions and classifications of SMEs are based on three main criteria: number of employees, firm turnover and value of assets (European Commission, 2005; Federal Government of Nigeria, 2013; Gibson and Vaart, 2008). In this paper, we adopt the number of employees as the main criteria to classify the firms, using the template proposed in the Nigerian National Enterprise Development Programme (Federal Government of Nigeria, 2013). While assets and annual turnovers are also important indicators of firm size, they are, unlike employee headcount, often limited in their international application, even in developing country contexts. For example, the assets criteria for a medium-scale enterprise in Thailand may be several times the assets requirement for medium-scale enterprises in Tanzania, as Thailand’s GDP is nine times that of Tanzania (The World Bank, 2016). The growth and performance of SMEs in Nigeria have been hampered by, among other things, lack of financing, poor infrastructure, inadequate access to machinery and spare parts, low access to raw materials (Ehinomen and Adeleke, 2012; Mambula, 2002). Their competitiveness is also limited by deficiencies in human capital and entrepreneurial capacity (Abiodun, 2015). Furthermore, Nigeria’s SMEs are generally limited in their capability to manage risks, including financial risks associated with fluctuations in the capital market, financial market and commodity market; operational risks arising from product failure and management fraud; and strategic risks related to competition, customer preference and policy issues (Yusuf and Dansu, 2013).

As highlighted in the foregoing, access to adequate financing is a major constraint for Nigeria’s SMEs. Majority of start-up funds are derived from personal savings and assistance from family and friends, with less than 5 per cent of start-up funds obtained from financial institutions (Federal Government of Nigeria, 2013). Furthermore, bank lending rate is high – between 25 and 30 per cent. According to a 2012 report, less than 1 per cent of SMEs have had access to bank finance in the previous three years (Federal Government of Nigeria, 2013). As of 2011, a six-year average of commercial bank loans to SMEs represented only 0.41 per cent of total credit (Central Bank of Nigeria, 2014). These were in spite of a federal government scheme in which 200 bn naira fund was provided to “fast-track the development of the manufacturing SME sector of the Nigerian economy by providing guarantee for credit from banks to SMEs and manufacturers” (Central Bank of Nigeria, 2010, p. 1). In addition, operating cost for SMEs in Nigeria is very high, mainly due to the lack of constant power supply in the country. Firms have to generate their own power using alternative means, and this significantly increases production costs and reduces profit margins for firms, especially in the manufacturing sector (Federal Government of Nigeria, 2013). The most recent enterprise survey by World Bank indicated that, among other things, the electricity problem has worsened between 2007 and 2014, with number of electrical outages increasing from 25 to 32, and firms incurring greater losses due to electrical outages. In 2010, Nigeria’s modest energy demand projections, to maintain a 7 per cent GDP growth, was set at 28,360 MW for the year 2015 (Sambo et al., 2010). However, as of October 2016, the peak power generation was 2,687.2 MW (Federal Ministry of Power Nigeria, 2016). In addition to the direct impact on operation cost, inadequate power supply significantly limits SMEs capability to access, adopt and benefit from innovations, as these innovations, such ICT innovations, relies heavily on electric power supply (Nyakuma et al., 2016).

Over the years the Nigerian Government has launched a wide range of policy initiatives to address the pressing needs of SMEs in the country. For example, the Small and Medium Enterprises Development Agency of Nigeria was established to help stimulate, coordinate and monitor the development of the sector. This is in addition to the work of the Corporate Affairs Commission, mandated to regulate the formation and management of companies in Nigeria and the Bank of Industry, whose core responsibility is to provide financial assistance to SMEs and support the expansion, diversification and modernisation of existing enterprises (Federal Government of Nigeria, 2013). However, the impact of these governmental and policy interventions have been limited. In some cases, the SME owners are not aware of the existence of government interventions (Jibrilla, 2013). Furthermore, the impact of the various initiatives have been hampered by poor implementation, bureaucracy and administrative bottlenecks, erratic financing of credit schemes initiated by governments, and the difficult conditions often set by banks and credit agencies for SMEs (Oni and Daniya, 2012).

3. METHODS

The instrument consisted of twenty items on a five-point Likert rating scale, which was administered on some selected owners of manufacturing SMEs sampled using cluster, proportionate and random sampling procedures from some selected businesses across Sango Area of Ogun State. Having employed proportional stratified and systematic sampling, the distribution of the questionnaires was based on the proportion of population of SMEs in Sango area. About twenty five days after the questionnaire have been
emailed to the respondents, 85 completed questionnaires were received through e-mail and these 85 questionnaires were regarded as early responses which (after non useable ones have been removed) were further used to assess non response bias on the actual variables. In order to improve the response rate, a follow-up phone calls and series of Short Message Service (SMS) were sent to remind the exporting managers who were yet to return their questionnaires. This effort yielded the largest numbers of response compared to the first response. About 85 questionnaires were returned.

4. RESULTS AND DISCUSSION

**H0**: There is no significant relationship between technological innovations and SMEs performance

From table 4.1.1, there is a weak positive relationship between technological innovation and SMEs performance with correlation coefficient of 0.29 (R=0.29). The adjusted R-square is 0.11 indicating that about 11% variation in SMEs Performance is influenced for by a little change in Technological innovations.

**TABLE 1.0 Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.029&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.001</td>
<td>~.011</td>
<td>.89342</td>
</tr>
</tbody>
</table>

Source: Survey, 2019

<sup>a</sup> Predictors: (Constant), SMEPERFORMA

**TABLE 2.0 ANOVA<sup>a</sup>**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>.055</td>
<td>1</td>
<td>.055</td>
<td>.069</td>
<td>.794&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Residual</td>
<td>66.251</td>
<td>83</td>
<td>.798</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>66.306</td>
<td>84</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey, 2019

<sup>a</sup> Dependent Variable: TECHINNOVATION

In order to test the validity of the model obtained, we went further by obtaining the ANOVA table, the F-value is 0.069 and the p-value is 0.000. This indicates that the model is adequate and sufficient in relating the technological innovation with the SMEs performance. Hence, the model is significant since the p-value is less than the significance level, we then accept the alternative hypothesis and conclude that there is a significant relationship between technological innovation and SMEs performance.

Table 3.0 is the coefficients table, the model is:

SMEPERFROMA = 7.503 + 0.33TECHINNOVATION

The model indicated that a unit change in TECHINNOVATION triggers a 0.33 unit increase in SMEsPERFORMA. The technological innovation is a little significant

**TABLE 3.0 Coefficients<sup>a</sup>**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>7.503</td>
<td>.915</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>SMEPERFORMA</td>
<td>.033</td>
<td>.126</td>
<td>.029</td>
<td>.262</td>
</tr>
</tbody>
</table>

Source: Survey, 2019
a. Dependent Variable: TECHINNOVATION

**Ho2**: There is no significant relationship between entrepreneurship training and SMEs performance

From table 4.0 above, there is a weak positive relationship between technological innovation and SMEs performance with correlation coefficient of 0.265 (R=0.27). The adjusted R-square is 0.59 indicating that about 59% variation in SMEs performance is caused by an impact in entrepreneurship training.

**TABLE 4.0 Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.265</td>
<td>.070</td>
<td>.059</td>
<td>.75584</td>
</tr>
</tbody>
</table>

Source: Survey, 2019

a. Predictors: (Constant), SMEPERFORMA

**TABLE 5.0 ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>3.571</td>
<td>1</td>
<td>3.571</td>
<td>6.252</td>
<td>.014</td>
</tr>
<tr>
<td>Residual</td>
<td>47.417</td>
<td>83</td>
<td>.571</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50.988</td>
<td>84</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: ENTRETRAIN

b. Predictors: (Constant), SMEPERFORMA and SMEs performance.

**TABLE 7.0 Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>9.112</td>
<td>.774</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMEPERFORMA</td>
<td>-2.267</td>
<td>.107</td>
<td>-2.65</td>
<td>.014</td>
</tr>
</tbody>
</table>

Source: Survey 2019

a. Dependent Variable: ENTRETRAIN

The model for the above is:

SMEPERFROMA = 9.112 – 0.267ENTRETRAIN

The model indicated that a unit change in ENTRETRAIN triggers a 26% unit decrease in SMEsPERFORMA. The ENTRETRAIN has a negative significance.

5. **CONCLUSIONS**

The main aim of this study was to analyze the impacts of technological innovation and entrepreneurship training on SMEs performance. In view of the competitive and challenging environment in which small businesses
operate, it is imperative for entrepreneurs to develop innovative approaches that guarantee strong business performance while meeting their customers’ expectations. The study’s findings reveal that technological innovation influences SME performance and that the entrepreneur training needs room for improvement in order for it to enhance small business performance. Thus, SMEs can maintain a competitive advantage by utilizing IT innovation through a robust Entrepreneurial training and capabilities firm development.

REFERENCES


TIE & DYE CRAFT AS A MEANS OF FEMALE GENDER EMPOWERMENT

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ABSTRACT
The unemployment rate in Nigeria is at a deplorable state as at the third quarter of 2018 rising from 18.8 percent in third quarter of 2017 to 23.1 percent in the third quarter of 2018. Therefore, in a country where the rate of unemployment is fast rising with hopelessness, the resultant effects mostly pose a wreck on the female gender as she is poorly encouraged for education, hence becoming vulnerable, molested, forced into sex trade, rape, premature marriage, domestic abuse and other forms of abuse. As a result of this, there is an urgent need to put into effect, mechanisms that would reduce or scrap the fast rising unemployment and its severe effects on the female gender. This study enumerates the importance of tie & dye craft as a means of empowerment for the female gender and analyzes the step by step procedures involved in its production in such a way that is learnable for a layman. The methodology used in this research include some literature reviews, one-on-one interviews and use of an autobiography. The study concludes that the practice of tie & dye, if embraced, can eliminate or reduce the incessant rate of unemployment among the female gender. It recommends, among others that both governments and nongovernmental organizations should create opportunities to encourage the development of tie & die as a major entrepreneur craft among the youths; especially the female gender

Keywords: Tie & Dye, Empowerment, Unemployment, Craft,

1.0 INTRODUCTION
Tie & dye, just as the name implies, literally, is the process of tying or binding a cloth before it is dyed to create a beautiful pattern. It is an old handcraft art which has its history cuts across the globe. One cannot say specifically where it started from. Africans, Indiana, Indonesians, Japanese, all have traces of this ancient tradition in their history of fabric design. Over the years, with the constant development of arts and crafts in different culture of the world, many new types of tie and dye techniques; but the fundamentals remain tie and dye.

From time immemorial, tie and dye has appeared in various fashion trends so much that it becomes popular and never stop to be in demand. Hence, its value as a vocational trade especially for women. In Nigeria, particularly in Yoruba land, another general name for tie & dye is Adire which is its direct translation. However, the technique of wax resist popularly called batik also emerged as a form of tie & dye fabric design. The difference between the two is that in typical traditional tie & dye, raffia or a kind of rope or thread is used to bind some specific area of the fabric before it is dyed. While in batik, wax (most often candle wax) is used to achieve the patterned area of the fabric, before it is dyed. This technique will also be briefly discussed in this paper as an additional information for people especially the female gender who may want to start producing this trade as their main part-time vocation. It is worthy of note that the word Kampala also emerged as another nomenclature for both tie & dye and batik at a point in time in history. A view of thought believes that this name takes its existence from Kampala the capital city of Uganda where a form of Adire is been produced and imported to West Africa particularly Nigeria where it becomes popular.
In view of the ongoing discussion on entrepreneurship, this paper intends to look at Tie and Dye as a vocational and entrepreneurship means, especially for the female gender who are the most vulnerable by the menace of unemployment.

The female gender in this context refers to both the youth and adult women generally. Some simple techniques and methods of producing tie and dye fabrics will be discussed and a female icon in the tie & dye business, in person of Chief Nike Davies-Okundaye, will be studied.

The study focuses primarily on tie and dye as a vocation. It enumerates the importance of tie & dye craft as a means of empowerment for the female gender which can enhance the female gender economically and it does analyze the step by step procedures involved in tie & dye production in such a way that is learnable for a layman.

The methodology used include literature review of existing academic materials on the topic, studio experiment and field trip to Itoku Market in Abeokuta, Ogun State, Nigeria where the business of tie and dye production is popular.

1.1. Problem Statement
The unemployment rate in Nigeria is at a deplorable state as at the third quarter of 2018 rising from 18.8 percent in third quarter of 2017 to 23.1 percent in the third quarter of 2018. Therefore, in a country where the rate of unemployment is fast rising with hopelessness, the resultant effects mostly pose a psychological cum physical wreck on the female gender as she is poorly encouraged for education, hence becoming vulnerable for molestations, forcefully lured into sex trade, rape, child marriage, domestic abuse and other forms of abuse. As a result of this, there is an urgent need to put in place, mechanisms that would reduce or scrap the fast rising unemployment and its severe effects on the female gender.

The methodology used include literature review of existing academic materials on the topic, studio experiment and field trip to Itoku Market in Abeokuta, Ogun State, Nigeria where the business of tie and dye production is popular.

2.0 LITERATURE REVIEW
According to the National Bureau of Statistics (NBS), the unemployment rate in Nigeria is at a deplorable state as at the third quarter of 2018 rising from 18.8 percent in third quarter of 2017 to 23.1 percent in the third quarter of 2018. In a simplified analysis, the total number of jobless citizens who are completely unattached to a remunerable job or partially work for a few hour below 20 hours within 7days rose from 17.6 million in the third quarter of 2017 to 20.9 million in the third quarter of 2018. Ediagbonanya, (2013) hence, the need for entrepreneurship in Nigeria increases by the day, as the rate of unemployment leaps nonstop.

The number of youths that our higher institutions turn out yearly is far higher than what the civil service and other existing jobs can absorb, hence the need to develop entrepreneurship education in Nigeria across all levels is Germaine. No wonder the Obasanjo led administration injected entrepreneurship education into the school curricula in all the tiers of tertiary education in 2006 (Oborah, 2006; Ajayi, 2019; Ediagbonanya, 2013). In the same vein, in March 2012, the NYSC leadership in the country also introduced Skill Acquisition and Entrepreneurship (SAED) programme into the orientation programme of the corps service. (Ajayi, 2019; Bola, 2019). The vocational trainings injected into the youth service programme include Bead Making, Aluminum Fabrication/Repair, Barbing/hair making, shoe making, Bag making, Fashion Design, Computer/Phone Engineering, Interior Decoration, Events Planning, etc. The essence of the introduction was to persistently make the Youth Corps members self independent after their service year.

From a lexicographic perspective, entrepreneurship is defined as the ability of a person to make an additional effort in order to achieve an objective or a goal Val, et.al (2017). According to Olawale, (2019), entrepreneurship is generally understood as the process of starting and owning a business that provides goods or
services to people in exchange for money. However, a person who creates and owns a business is called an entrepreneur. Furthermore, Brown (1997) defines entrepreneur as a person who recognizes a business opportunity and who organizes, manages and assumes the risk of a business enterprise focusing on that business opportunity.

Val, Gonzalez, Irritates Beiva, Lasa and Maite (2017) examined entrepreneur education in European school curricula with an attempt to ignite the spirit of entrepreneur in the upcoming generation. Similarly, Olawale, (2019) opines that entrepreneur is a mindset, a way of thinking which goes beyond buying and selling or production of goods to creation of new ways to solve problems and create value. He argues that an entrepreneurial spirit is to be characterized by innovation and risk taking. While on the other hand, Ajayi (2019) listed entrepreneurship subjects in our higher institutions and advocated that photography should be given more attention as a vocational course.

In explaining the processes involved in the production of tie & dye, it behooves to be well informed of all the materials/tools instrumental for its production. However, Xiaohua, 2016 researched on tie and dye techniques and its application to puppet products while 4-H Manitoba, 2015 explains the materials and techniques of producing tie and dye fabrics with step by step processes.

3.0 METHODOLOGY

The methodology used in this research include some literature reviews, one-on-one interviews and the use of an autobiography. In respect to the on field work carried out at Itori area of Ogun State, an interview was taken to use in documenting a comprehensive analysis on how to go about the tie & dye fabric production, different techniques and some of the materials/tools required. Moreover, notes on the history of Chief Nike Davies-Okundaye were retrieved from online sources ranging from her official Facebook handle, her website and others.

3.1. Materials

During the course of the interview carried out, a lot of expository discussions ensued revolving around several materials that foster the production of tie & dye. The basic materials for the production of tie and dye include

i. Fabrics: Suitable fabrics for tie and dye include pure cotton, silk, some rayon, wool, guinea brocade and some Ankara prints. Some fabrics like synthetic, polyester, acrylic, will not absorb dye, so they cannot be used. During production the fabric has to be washed first in order to remove sizing. This is the industrial starch on new fabrics. If not removes, it will prevent the dye from sticking to the cloth (E. H. Manitoba, 2019)

ii. Threads: The thread which is also called bindings could be string, twine cord or rubber. In Yoruba land, Nigeria, Raffia is used mostly.

iii. Dyes: Apart from the traditional indigo dye, the synthetic ones are imported. Due stuffs been used here in Nigeria, they are in various colours.

iv. Caustic Soda: This is mixes together with the dye stuff and hydrosulphite in good proportion. It serves as the chemical agent which allows both the dye stuff and the hydrosulphite to work on the fabric as it breaks down the content of the fabric to allow penetration of the dye. Caustic soda should not be over used on the fabric, it can damage it by tearing it apart.

v. Hydrosulphite: Like caustic soda, this chemical substance is mixed on a recommended ratio, with dye stuff and caustic soda. In proportion or quantity, it should be more than the soda. It allows the dye to fasten or stick to the fabric permanently. There is no restrictions to the quantity of hydrosulphite (also called salt). Some people even use common salt in lieu of sulphite.
vi. Candle Wax: This is used for batik production. It is used as resist means for the dye not to penetrate the design area. It will be removed or dewaxed after dyeing with hot water.

![Batik](image)

**Fig. 1:** Batik. Source: Authors

Other materials are needle, rubber gloves, pots for boiling water, stove, buckets and bowls, among others.

### 3.2. The Workings of Tie & Dye Is A Means of Empowerment

There are several benefits embedded in employing tie & dye as a medium of entrepreneurship. The benefits range from the ever readily materials instrumental for its production which are accessible in various local markets; the tools which are common household items; the techniques and technology involved which are simple methods which with few practices one can master; the ready market for tie & dye products both locally and internationally; the fashion that is a revolving trend like Ankara prints makes the relevance of tie & dye in contemporary fashion and garment design significant and the innumerable techniques of creating new patterns based on individual's creativity. Hence, the knowledge of tie & dye for the female/male gender will enable whoever chooses to embrace the craft as means of livelihood as its lucrative nature is unquantifiable. Tie and Dye or Adire is an easy to do and flexible trade which have a lot of possibilities of been a profitable vocation for women.

### 4. FINDINGS

Through various interviews carried out at Itoku market vis-a-vis the authors' robust experience in the field, it was gathered that there is no limit or hard rules to the methods used for tie & dye, however, some basic processes must be followed. Asides the existing traditional methods, each individual entrepreneur can evolve his/her own methods. However, the following should be noted:

i. The binding or tying of fabric should be firm or tied tightly in order to get good effect.

ii. Warm water is used for mixture of the dye stuff and the chemicals. Though after it has thoroughly been mixed, cold water can be added to increase the level of the water to accommodate the number of fabrics to be dyed.

iii. When dyeing more than one colour, it is better to start with the lightest colour e.g Yellow and purple. Yellow should be dyed first

iv. In tie & dye the process is tying first, dye, rinse and allow to dry. One can remove the thread before drying or after, as long as there are no more excess dye on the fabric after rinsing.

v. Always allow your fabric to stay for a while inside the dye bath or bowl. We recommend between 5-10 minutes if the chemicals are properly mixed.
vi. Applying the Thread or Raffia: in applying the thread or raffia to the fabric, one considers the width or narrowness. If it is wide, the raffia is wrapped around the fabric several times. However, if it is thin or narrow, the raffia goes round it one or two times if you want the effect of lacey-spider, wrap the raffia up and down in criss-cross manner.

Fig. 2: Post-Dye, Crisscross pattern. Source: Authors

However, it is always good to leave some area of the fabric free from tying and binding.

4.1 Techniques

Several techniques are used to produce tie & dye. The techniques range from tying method, folding, stitching or needle, knotting, marbing, pleating, twisting, adire ekeko, adire eleso, et.al

The following is a brief explanation on few of the techniques

i. Tying Method: it is also called binding method, it has several form of tying which include stone, seeds or pebble tying, spot tying, circle method, etc. Stone, Seed or Pebbles are placed on the fabric, the fabric is folded over it while raffia is tied around the stone in a circular manner, this is repeated all over the fabric to the satisfaction of the artist. It is dyed, rinsed, untied and dried for finishing.
• Circle Method – Determine the centre of the fabric, prick it and bind it according to the below illustration

![Fig. 4: Post-Dye (1Colour) Circle](image1)
Source: Authors

![Fig. 5: Post-Dye (2 Colours) Circle](image2)
Source: Authors

ii. Folding Technique: There are innumerable methods of folding. The entrepreneur will discover more as (he) practices.

iii. Marbling Technique: This is a recent method. Though there are several ways of achieving marbling effect in the fabric, the basic foundation is that it is done on the floor not inside dye bath or bowl. The fabric is placed on the floor after rinsing to remove the sizing. It is then squeezed as the artist desires. Part of it can be tied. Dye is poured randomly on it on the floor in a pleasing manner to the artist. If many colours are to be used, it will be done the same way.
iv. Knitting Method: fold up a piece of fabric into a string and tie it into knots. Due, rinse, untie and dry.

4.2. Nike Davies-Okundaye

Many women are involved in the production of tie & dye in Nigeria especially the South West. Places like Abeokuta, Osogbo are well known cities for this practice. Few people in Ondo, Ibadan, Ogbomosho, Oyo and Ilorin also produce Adire though in small quantities compared to the other two mentioned above. (Newman, 1975). Prominent among those women is Chief Nike Davies-Okundaye. Born in 1951 in Ofisi, Kogi State, Nigeria. Nike's experience as a craft woman started from childhood as her family were into traditional weaving and dying. They used indigo colour for their dying. She spent part of her early life in Osogbo, Osun State, Nigeria. (Nikeart.com). We should note that Osogbo is a prominent centre for art and culture in the Southwestern Nigeria.

Fig. 6.: Post-Dye, Marbling pattern. Source: 4-H Manitoba

Fig. 7.: Nike Davies-Okundaiye in one of her Art galleries. Source: Authors

Through her training and experience cum years of serious and consistent practice, she was led into prominence in the trade. She had facilitated workshops on traditional Nigerian textiles in the United States of America, Europe and Nigeria. She had participated and individually hosted many exhibitions. Nike is the founder and director of four (4) art centres which offer free training to several young artists in visual, musical and performing arts. Her collections comprising over 7000 artworks which include tie & dye and other related Adire works. (Nikeart.com, 2019).

Nike Davies-Okundaye's opinion is that the traditional art of Adire Eleko is fading away hence, she took it upon herself to promote it by educating youths especially the female gender. She teaches technique of indigo dying to local women in her workshops and other training programmes. She has her works in several art galleries in different locations in Nigeria and abroad, including the Gallery of African Art and the British Library in London. Gafraart.com (2019), Vaz, (1995).

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

In conclusion, Entrepreneurship is not just the ability to establish a business, but the development of the spirit of innovation and creativity which allows an individual to be able to add value to himself or herself and also to the immediate environment. Part of the means through which a society can add value to its citizens especially the female gender is by empowering them to be entrepreneurs. Tie and Dye or Adire is an easy to do trade which
have a lot of possibilities of being a profitable vocation for women. Hence, this paper had been able to do a comprehensive justice to the procedures involved in producing a viable and lucrative craft known as tie & die.

5.2 Recommendation

The government at all levels should create programs that will encourage the development of traditional crafts which may fade away if attention is not given to them. More so if well sponsored they are capable of enhancing the economy of individuals and the nation generally. Both public and private schools at all levels should also embrace and be very pragmatic with the teaching of trade subjects especially tie and dye. Women transmit family values to their children better than men, so if women are trained and become versatile in any vocation, they impact them to their children and it goes on and on like that.

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IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ON QUALITATIVE SERVICE DELIVERY IN HOSPITALITY INDUSTRY

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ABSTRACT

The study focused on impact of information and communication technology (ICT) on qualitative service delivery in hospitality industry using five selected hotels in Abeokuta as study area. It is an empirical study whose major source of data was primary source through questionnaire which was conducted among 102 respondents. The main objective of this research work is to find out the major Impact of Information and Communication Technology (ICT) on Qualitative Service Delivery in hospitality industry. It is a research whose data analysis method involves the use of descriptive statistics techniques such as frequencies and simple percentages was done and hypothesis tested via Chi-square ($X^2$). It was found out from the study that the availability of technological facilities within selected hotels in the study area significantly improve the Qualitative Service Delivery in the selected hotels. Also, the respondents indicated that technology has improved rate of patronage, reduced cost of operations, improved customer service and increased awareness in the usage of the various available technological facilities in the study area respectively.

The study therefore recommends that hotels in the study area should ensure the adequacy of these technological facilities in their hotels and also ensure the effectiveness and efficiency of these facilities. Hotels in the study area should ensure regular maintenance of these technological facilities in order to ensure profit maximization.

The study concludes that if the information communication technologies in the study area are used effectively, it will yield a positive impact on guest experience and that of the industry but their service could be more improved when most of these technological facilities are more effective in their usage.

Keywords: hospitality, Information, technology.

1.0 INTRODUCTION

Technology development is generally regarded as a catalyst for national development, because it offers among other things, the necessary support for change in all the major sectors of the economy, most especially in hotels and industrial sectors. It is unarguably the prime source of change, that is, of innovations and adaptations required for improving production methods needed to propel growth and development (Kayode, 2010).

According to Walker (2010) technology has a great impact on the hospitality industry in recent years, and this will continue to increase the uses of computers and the growth of information technology in general.

Technology has a wide range of definitions; nevertheless, it is a term traceable to “techne” which means activities by which man seeks to adapt to his environment. It is defined by Hornby (2012) as a scientific knowledge, used in practical ways, especially in the designing of new machines, machineries and equipment.

Information Communication Technology (ICT) is defined as the use of digital tools for business function and processes. ICT includes the use of hardware, software, groupware, telecommunications, net ware and the intellectual capacity also known as human ware to develop programmes and preserve equipment (Cooper et.al, 2013).

Emergence and use of technologies in hospitality industries such as Local Area Wireless Computer Networking (Wi-Fi-hotspot) internet service, Close Circuit Televisions (CCTVs), online booking, in-room entertainment system, smoke detector, Liquid Crystal Display (LCDs) etc. have made it easier for professionals to convert, store, manipulate and share data and information both individually and within organizations, small and large, public and private. Technology has become an integral part of human daily activities that sometimes we barely notice its effect and has made a major impact on the way we live, work and play. The way hotel
industries provide services to their customers has changed over the past few years. The use of networking in front office helps very much in strong information across the hotels in chain. Nwakanma, et.al, (2014).

Hotel managers have come to expect benefits from this technology in the form of enhanced customer services and operational efficiency. Wireless technologies have also experienced an unprecedented growth despite the rising concerns about security issues. Some of the most significant information technological applications involve the use of mobile handheld devices, such as personal digital assistants (PDA), tablet PCs, and cellular phones. Additionally, one of the most common wireless technologies impacting the hotel industry is Wi-Fi. This allows hotel customers to access the internet from a bar, restaurant, lobby or guest room. Gatner Group reported that hotels remained the leading Wi-Fi hotspot locations in the world with more than 60,000 sites. Many hotel guests have come to think of their hotel room as a home away from home (Paret, 2011). As such they expect hotels to offer at least the same level of options for entertainment as they have at their homes. This increasing level of guest expectations has brought about a surge of methods for integrating consumer entertainment technologies into hotel rooms (Beldona, and Cobanoglu, 2010).

2.0 MATERIALS AND METHODS

Study Area
This study was carried out in selected hotels in Abeokuta areas of Ogun State.

Study design
The study was cross sectional and descriptive in nature and involved hotel workers in selected hotels in Abeokuta Ogun state.

Sample size and techniques
Five (5) hotels were purposely selected for this research work in Abeokuta Ogun State. A total of 102 respondents were selected through a simple random sampling technique.

Data collection
A semi structured questionnaire was administered for data collection, questions were asked on areas peculiar to the study; Section A contains the socio-economic characteristics of the respondents. Section B contains the various information communication technologies available for use among hospitality industries in the study area , Section C contains the Perception of the respondents to the effectiveness of technological facility in the study area while Section D Challenges Facing Customers in the use of hotel technologies in the study area

3.0 DATA ANALYSIS

Data collected on this study was subjected to descriptive statistic using statistical packaged for social scientist (SPSS) version 20.

Results
Table 1 shows the socioeconomic characteristics of the respondents. It shows that 52.9% of the respondents were male and 47.1% of the respondents were female respectively. It also shows that 55.9% of the respondents were between the age limit of 31-40yrs, 44.1% were between 20-30yrs respectively. It also revealed that 64.7% of the respondents were married, 35.3% were single respectively. The table also shows that 88.2% of the respondents were HND/BSc holders, 11.8% were SSCE holders respectively. The table further reveals that 32.4% of the respondents are waiters, 29.4% of the respondents are receptionist, 11.8% of the respondents are kitchen staff, 8.8% of the respondents are security, 7.8% of the respondents are chef, and 5.9% of the respondents are manager and 3.9% of the respondent as laundry.

The table also shows that 67.6% of the respondents have been working for 5-10 years, 32.4% of the respondents have been working for 2-5 respectively. The table also reveals that 78.4% of the respondents are Christians while 21.6% of the them are practicing islam respectively.

Table 1: Distribution of respondents by socio-economic characteristics

<table>
<thead>
<tr>
<th>Socio-Economic Characteristics</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>54</td>
<td>52.9</td>
</tr>
<tr>
<td>Female</td>
<td>48</td>
<td>47.1</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-30 years</td>
<td>45</td>
<td>44.1</td>
</tr>
<tr>
<td>31-40 years</td>
<td>57</td>
<td>55.9</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>36</td>
<td>35.3</td>
</tr>
<tr>
<td>Married</td>
<td>66</td>
<td>64.7</td>
</tr>
</tbody>
</table>
Table 2 shows the technological facility available in the selected hotels. 73.5% of the respondents said that there is no mechanical lift while 26.5% of the respondents said there is in their hotel. Also from the table 100% of the respondents said wifi-hotspot is available in their hotels. It can also be seen from the table below that 100% of the respondents said online booking is available in their hotels. The table also revealed that 81.4% of the respondents said there are no recreational games while 18.6% of there is in their hotels. The table also reveals that the majority of the technological facilities available for use in the study areas include In-room check out (96.1%), online check-in and out (96.1%), mobile handheld devices (92.2%), intercom in all rooms (100.0%), CCTV camera (84.3%), smoke detector (97.1%), biometrics for staff members’ time and attendance records (80.4%), personal digital assistant (84.3%) and printer/fax machines (100.0%) respectively.

Table 2: Technological facility available in the selected hotels

<table>
<thead>
<tr>
<th>Technological facilities</th>
<th>Available</th>
<th></th>
<th>Not available</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Mechanical lift</td>
<td>27</td>
<td>26.5</td>
<td>75</td>
<td>73.5</td>
</tr>
<tr>
<td>Wifi-hotspot (wireless) internet service</td>
<td>102</td>
<td>100.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Online booking</td>
<td>102</td>
<td>100.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Recreational video games</td>
<td>19</td>
<td>18.6</td>
<td>83</td>
<td>81.4</td>
</tr>
<tr>
<td>In-room check out</td>
<td>98</td>
<td>96.1</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td>Online check-in and out</td>
<td>98</td>
<td>96.1</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td>Mobile handheld devices</td>
<td>94</td>
<td>92.2</td>
<td>8</td>
<td>7.8</td>
</tr>
<tr>
<td>Intercom in all rooms</td>
<td>102</td>
<td>100.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CCTV Camera</td>
<td>86</td>
<td>84.3</td>
<td>16</td>
<td>15.7</td>
</tr>
<tr>
<td>Smoke detector</td>
<td>99</td>
<td>97.1</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>Biometrics for staff members’ time and attendance records</td>
<td>82</td>
<td>80.4</td>
<td>20</td>
<td>19.6</td>
</tr>
<tr>
<td>Personal digital assistant (PDA)</td>
<td>86</td>
<td>84.3</td>
<td>16</td>
<td>15.7</td>
</tr>
<tr>
<td>Printers and fax machines</td>
<td>102</td>
<td>100.0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 3 shows the perception of the effectiveness of the technological facility provided in the Study Area
The table reveals that 97.1% of the respondents agreed that the use of technologies has reduced hotel charges thereby reducing production costs while 2.9% of the respondents strongly agreed respectively. Also from the table 100% of the respondents agreed that Technology has improved rate of patronage of customers in their hotels respectively.

And it was further revealed that the majority if the respondents of about 97.1% agreed that Hotel technologies have reduced operational cost, improved customer service and has increased awareness in the study area.
Table 3: The perception of the effectiveness of the technological facilities provided in the Study Area.

<table>
<thead>
<tr>
<th>Perceptual Statements</th>
<th>SA</th>
<th></th>
<th>A</th>
<th></th>
<th>U</th>
<th></th>
<th>D</th>
<th></th>
<th>SD</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The use of technologies has reduced hotel charges thereby reducing production costs</td>
<td>3</td>
<td>2.9</td>
<td>99</td>
<td>97.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Technology has improved rate of patronage</td>
<td>-</td>
<td>-</td>
<td>102</td>
<td>100.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hotel technologies have reduced operational cost</td>
<td>3</td>
<td>2.9</td>
<td>99</td>
<td>97.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>The use of ICT has improved customer service</td>
<td>3</td>
<td>2.9</td>
<td>99</td>
<td>97.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>The use of ICT has increased awareness in the study area</td>
<td>3</td>
<td>2.9</td>
<td>99</td>
<td>97.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 4 shows the challenges militating against the usage of technological facilities in the study area. The table revealed that majority the respondents of about 73.5% indicated erratic power supply as a very serious problem facing the use of hotel technological facilities among sampled hotels in the study area. It was further revealed from the table that 62.7% of the respondents network problem as another very serious challenge facing hotel technology usage in the study area respectively. The table also shows that majority of the respondents of about 100%, 97.1% revealed that there is a Lack of technical usage on the part of the customers, Fear of fraud and the Inability to maintain the technological facilities in the study area.

Table 4: challenges militating against the usage of technological facilities in the study area

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Very serious</th>
<th></th>
<th>Serious</th>
<th></th>
<th>Not serious</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq</td>
<td>%</td>
<td>Freq</td>
<td>%</td>
<td>Freq</td>
<td>%</td>
</tr>
<tr>
<td>Erratic power supply</td>
<td>75</td>
<td>73.5</td>
<td>3</td>
<td>2.9</td>
<td>24</td>
<td>23.5</td>
</tr>
<tr>
<td>Network problem</td>
<td>64</td>
<td>62.7</td>
<td>2</td>
<td>2.0</td>
<td>36</td>
<td>35.3</td>
</tr>
<tr>
<td>Lack of technical usage on the part of the customers</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>102</td>
<td>100.0</td>
</tr>
<tr>
<td>Fear of fraud</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>2.9</td>
<td>99</td>
<td>97.1</td>
</tr>
<tr>
<td>Inability to maintain these technological facilities</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>2.9</td>
<td>99</td>
<td>97.1</td>
</tr>
</tbody>
</table>

Table 5 showing Chi-square analysis of the relationship between respondents’ perception and the use of technological facilities revealed that the chi-square calculated score ($\chi^2 = 174.070$, $p < 0.05$) is greater than the chi-square tabulated ($\chi^2 = 171.286$, $p < 0.05$). The null hypothesis is therefore rejected. The implication of this is that respondents’ attitude towards the availability and effectiveness of hotel technological facilities has a direct relationship with how respondents use technologies available in hotel industries in the study area.

Table 5: Chi-square analysis of the significant relationship between respondents’ attitudinal responses and technology deployment

<table>
<thead>
<tr>
<th>Variables</th>
<th>df</th>
<th>X^2tab</th>
<th>\chi^2 cal</th>
<th>Sig.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents perception</td>
<td>46</td>
<td>171.286</td>
<td>174.070$^a$</td>
<td>Significant</td>
<td>Reject H$_0$</td>
</tr>
</tbody>
</table>

4.0 SUMMARY
The study focused on the impact of Information and Communication Technology (ICT) on qualitative service delivery in Hospitality Industry using five selected Hotels in Ogun state. It was found out from this research that the hotels have various technological facilities available for use among hotel industries in the study area. An evaluation of the availability of technological facilities within selected hotels in the study area revealed that facilities available which include, wifi-hot spot internet services, online booking, in-room check out, online...
check-in and out, mobile handheld devices, intercom in all rooms, CCTV camera, smoke detector, biometrics for staff members’ time and attendance records, personal digital assistant and printer/fax machines which is in line with Beldona, S., & Cobanoglu, C. (2007). Apart from this, the result also shows that use of technologies has reduced hotel charges thereby reducing reduced production costs in the study area. Also, the respondents indicated that technology has improved rate of patronage, reduced cost of operations, improved customer service and increased awareness in the study area respectively. It was also obtained from the respondents that most of the challenges facing technological utilization among hospitality industries in the study area are power supply and network problem which are the highest ranked problems facing hotel technology utilization.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

It can be concluded from this research that information communication technologies were in use in most of the hospitality industries in the study area with a positive impact on guest experience and that of the industry but their service could be more improved when most of these technological facilities are more effective in their usage.

5.2 Recommendations

Hotels in the study area should ensure the adequacy of these technological facilities in their hotels and also ensure the effectiveness and efficiency of these facilities and hotels in the study area should also ensure regular maintenance of these technological facilities in order to ensure profit maximization.

REFERENCES


ABSTRACT

The issue of gender equality in modern organizations is receiving more attention from scholars across the globe. The perception of women towards equality in their organization is significant as it directly impacts on their job satisfaction. The study adopted a survey research design which necessitate the use of a structured questionnaire to obtain valuable data from 85 female employees of May and Baker limited, Ota branch. The gathered data was analyzed using Ordinary Least Square method while the hypotheses were tested using regression analysis. The findings of the study revealed that fair representation in management by female employees significantly affect the acceptance of policies and regulations (p=0.000). Similarly, the study discovered that perceived fairness of promotion exercise significantly affects commitment of the female employees in the study area (p=0.001). Based on the findings of the study, it was recommended that organizations should promote a gender sensitive atmosphere in order to bolster the performance of female employees in an organization.

KEYWORDS: Gender equality, management, promotion, commitment, satisfaction.

INTRODUCTION

Gender equality at the workplace suggests equal rights, responsibilities and opportunities given to men and women in employment (UN, 2013). Equality in itself does not suggest that both sexes will become the same but that their rights, responsibilities and opportunities will not depend on their gender.

The 20th century witnessed the collapse of traditional gender segregation as women started making major contributions in the labour force, education systems, academics and public offices. Women have made giant strides in both education and the utilization of that education in the workforce over the past sixty years (Ziman, 2013). More women are receiving higher education which the figure is even surpassing that of men. As a result, women are entering the workforce with high hopes and dreams of future success.

Despite the efforts of women in competing favorably against their male counterparts, research has shown that there exists inequality among the genders in the work environment. Unequal benefits for different genders on the same level create an atmosphere of hostility in the workplace and costly human resource management. Meanwhile, research has shown that a more equalized gender distribution in the workplace offers more hospitality and professionalism, which also guarantees a healthy career path (Ruohan & Xueyu, 2014).

There exist the “glass ceiling” at the workplace which is an invisible barrier that inhibits the progression to higher levels of an organization’s hierarchy for women and other disadvantaged minority groups. This is a situation where women are fixed at lower levels of an organization and there is very little or no opportunity for development and advancement. The issue of gender equality is relatively critical to the success of any organization as extant researches have shown that organizations who are very gender sensitive tend to do well compared to those who do not.

It is against this background that the current study set out to examine how perceived gender equality affect the satisfaction of female employees of an organization. To pursue this broad objective, the study seeks to test the validity of these hypothetical statements:
H₀₁: Perceived fair representation of female employees in management does not affect acceptance of policies and regulations.

H₀₂: Perceived fairness of promotion exercise does not affect commitment of female employees in an organization

2 LITERATURE REVIEW

2.1 Conceptual Review

Female representation in Management

Human talent such as skills, education level and productivity of both females and males is one of the most important determinants of an organization’s competitiveness. In a study carried out by Ruohan and Xueyu on Chilean Manufacturing firms in 2014, it was discovered that small firms with less than 50 employees, higher female labor-force participation among high-skill employees significantly increased the firm’s productivity.

The positive effects women leaders can have on an organization’s long term achievement has been proven not only in the USA but elsewhere worldwide. Research has shown that European firms with the highest percentage of women in roles with significant influence saw their stock value climb an extra seventeen percent over a two year period (Cooper & Baird, 2017).

Similarly, Annis and John (2016) found that men’s thoughts and opinions are often formed and stated quickly and that they look at team work as a quick agenda-driven exercise to conform a course of action and the sooner they can wrap up the meeting and get back to work, the better. Women on the other hand consider teamwork and collaboration to be an essential part of work.

A professor at the London School of Economics also discovered that women tend to be more risk-averse than men. He also concluded that women on boards would be more vigilant than men and would have paid more attention to what executives were doing.

Unbiased promotion exercise and commitment of Female employees

More education generally equates to higher qualifications. More women are receiving degrees today than ever before. This trend should allow women to achieve higher level positions in the organization through promotion exercise.

Organizations tend to consider a lot of factors in promoting their employees to another level within the ranks (Wittenberg, 2015). It becomes crucial that promotion exercises are unbiased and favorable to the female employees also. However, the sad story that obtains in Nigeria is that female employees do not get their promotion based on merit (which should have been) but through cutting of corners. This would not have been the case if only promotion exercises were more objective and unbiased. Research has shown that female employees who perceives promotion exercise as biased tend to quit the organization.

2.2 Theoretical Review

Human Capital Theory

Neo-classical economists argues that a worker’s education, training and natural capability determines the rewards they get from their job. The theory argued that organizations configure their recruitment decisions on the market value of each individuals’ human capital. This school of thought is called the human capital theory. Human capital theorist explain the position of women in paid jobs in terms of their lesser human capital, arguing that women have reached fewer skills and qualifications and lesser labour market than men (French & Strachan, 2018). This school of thought argues further that because of traditional gender division of labour involving women’s engagement with house chores and rearing children, women tend to possess inferior skills as compared to men.
Radical Feminist Theory

Radical feminism originated in the 1970s in USA. Historically, radical feminism began with the assumption that the sexes are adversarially poised, that men have more power over women and that society and its various social relationships can be best understood in terms of their relationship to that situation (Kulik, 2014).

Radical feminist argue that men benefit from domestic labour as a dominant task completed by women in their families. They treat this gender division of labour as the root of patriarchal social relations giving advantages to men and women in employment.

Both human capital theory and the radical feminist theory are important to this study because they typify the situation in Nigeria where as a result of the society, women are not given equal chances like their male counterparts.

3 METHODOLOGY

3.1 Research Design
The study adopted a descriptive and survey design because data was sought through the use of a structured questionnaire.

3.2 Population of the Study
The population of the study comprise of all female employees working in May & Baker Ltd, Ota branch with an estimated figure of eighty-five (85).

3.3 Sample Size and Sampling Technique
A sample is a representative of the entire population who shares similar features with other members of the population and whose opinion can be generalized on the population. The population of this study was retained as the sample size given the desire for effective generalization of this study.

3.4 Research Instrument
The questionnaire is the chosen research instrument for data collection for this study. The questionnaire is structured on a five point Likert scale: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD) and Undecided (U).

3.5 Validity and Reliability Test
The questionnaire validity test was carried out using content and face validity with the help of instrument validation experts and management experts. Cronbach (1951) Alpha test was utilized to test the reliability of the research instrument which yielded a result of .795.

3.6 Method of Data Analysis
The collected data was analyzed by Ordinary Least Square method using SPSS version 20 software. The research hypotheses for this study was tested using regression analysis at 5% level of significance.

4 DATA PRESENTATION
Table 1: Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.795</td>
<td>85</td>
</tr>
</tbody>
</table>

Table 1 shows the reliability test with a value of 0.795 which translates that the research instrument was sufficient to obtain the required information from the respondents on the subject matter.
Table 2: Coefficients result

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>(Constant)</td>
<td>90.319</td>
<td>70.879</td>
</tr>
<tr>
<td>Perceived Fair Representation in Management</td>
<td>3.447</td>
<td>.135</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Acceptance of Policies

Table 2 above shows the significance of the variables and the relationship between the dependent variable and the predictor. The coefficient result of 3.447 indicates that there is a positive relationship between perceived fair representation in management by female employees and acceptance of policies. The significance value of Perceived Fair Representation in Management standing at 0.000 indicates that the variable is statistically significant at 5% level of significance.

Table 3: Coefficients Result

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>(Constant)</td>
<td>100.183</td>
<td>120.083</td>
</tr>
<tr>
<td>Perceived fairness of Promotion exercise</td>
<td>78.531</td>
<td>11.822</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Female Employees’ Commitment

Table 3 above shows the significance of the variable and also the relationship between the dependent variable and the predictor. The coefficient result of 78.531 indicates that there is a positive relationship between Perceived fairness of promotion exercise and female employees’ commitment. The significance value of perceived fairness of promotion exercise standing at 0.001 indicates that the variable is statistically significant at 5% level of significance.

5 CONCLUSION

When organizations look at the time and expenses associated with eliminating gender inequality in the workplace, it is easy to just stick it on an endless to do list and forget about it. This is a terrible choice because women can add great value, both socially and more importantly to a list of executives, monetarily, to a company.

The findings of this study revealed the implications of having an organization in an atmosphere that is gender sensitive. If companies choose to disregard gender issues, they will only be hurting themselves and their future growth and success.

6 RECOMMENDATIONS

Based on the findings of this study, the following were deemed necessary in every organization:

a. Management should give leadership opportunities to women so that they can have more managerial experience.

b. Regular training and development programmes should be served to the female workers.

c. Promotion exercises should be free from biasedness.
7 SUGGESTION FOR FUTURE STUDIES

Future studies should consider more areas regarding gender equality in order to further improve the generalization of this kind of study to other sectors of the economy.

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THE EMERGENCE OF WOMEN IN AFRICAN LITERATURE: THE FRANCOPHONE EXPERIENCE.

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ABSTRACT
It has become quite natural to see that when critics talk about African literature, they are most likely talking about literature written by African men. It is not that they set out to exclude or relegate African women writers, it is that it is “so natural” according to a certain critic to neglect to mention African female writers. This paper is written with the intention of tracing the history of women writing in African literature, to point out some of the challenges faced by African women writers and to give some recommendations that we feel may improve the lot of African women writers. The advent of African women writers varies depending on their language zone – Anglophone, Francophone, Lusophone. We will, in this paper however focus on African women writers in the francophone region while not neglecting their Anglophone colleagues.

Keywords: Women, African literature, Francophone

1.0 INTRODUCTION

African literature has come a long way from the pre-colonial times to the post-colonial era. In all of this time however, there seems to have been a disconnect between the male African writes and their female counterparts. The African literary space has been mostly dominated by male writers who have made their mark in addressing several societal issues. With their writings, male African writers engaged the society, colonialists and the ruling political elites on germane issues that affected the society. It however took a while for the African literary sphere to start experiencing the input of female writers. This paper aims to look at how female francophone writers entered the African literary sphere and to examine and to examine some of their predominant themes in writing.

African literature was until the advent of the colonialists largely unwritten. It was expressed in songs, poems, dance and other forms of oral expressions. The text or script was passed down generation to generation via the old to the young. It was not rare to find families whose living was generally derived from the text that was handed down to the new generation. At thus pre-colonial stage, the aged were the revered walking libraries of the history, culture and ways of the people. This mode of literature, was employed not just for pleasure, but also for more serious matters such as speaking against social vices or politically vicious men, encouraging and boosting the morale of warriors for battle and even as a means of surrender to a stronger kingdom. This form of literature is what Luzolo Mbemba calls the true African literature.

The advent of the colonialists through slave trade and then religion introduced an attempt to document the literature of the African content in writing. Across the continent, westerners – English, French, and Portuguese - wrote about the African continent and for the African continent, albeit from their own point of view. Scholars have come to agree that literary texts in this era cannot be said to truly depict Africa. A number of literatures produced in this era were largely propaganda by colonialists in order to encourage the continued occupation of Africa.

Toward the end of the colonial era, a new wave of writings begin with Africans who had been traditionally taught but now had the privilege to travel overseas for white “formal” education. According to Luzolo Mbemba, this period was made possible by the inspiration of what has been termed “l’Eveil Africain” (Africa awakening). Writers in this era, the likes of Leopold sedar Senghor, Ferdinand Oyono, Ousmane Sembene, Mongo Beti etc, pushed the Negritude movement for an Africa by Africans and an African literature written by Africans. It is
Contemporary African literature has seen some way a better involvement by women in the literary space. Although, there is still a lot of space for the African women writer.

2.0 EMERGENCE OF WOMEN IN AFRICAN LITERATURE

Although certain critics according to Kolawole (1997) would have us believe that the African woman is no artist has over the years merely parroted communal oral pieces created by her male counterpart, the African oral literature celebrated the African woman as she played her part in society. The pre-colonial African woman was of no mean spirit, she was counted among the best griots, the best musicians, sometimes even among the fiercest warriors a sis seen in the case of the Amazons of Dahomey. According to Grace Ogot(1976), the pre-colonial African woman knew her rights and roles in pre colonial African society. She was consulted on matters of importance such as on war, medicine, land matters and politics. She did not make any public pronouncements, leaving that to the man, but her opinion was nonetheless taking into consideration before any decision- major or minor- was made. According to Kolawole (1997), “Women use oral literature and exclusive female genres to condemn social problems, immorality, unfaithfulness and idleness- and to make demands” (pg 94-95)

With the advent of western education however, a gap was created between the woman and the man, as the African boy was allowed to be the first to taste western education. The earliest record of an African female writing is dated 1967 with Flora Nwapa’s Efuru from Anglophone Nigeria. Although there had been black women writers such as the Antillean sisters Paulette and Jane Nardal who held “salon-style meetings” in the late 1920s nd 1930s in support of the negritude movement, there were no African women who could have been said to have been actively involved in the African literary scene. The Nardal’s salon produced La Revue du Monde Noir, a bilingual magazine lending its voice to the negritude movement that was in swing in those days. Although initially disregarded, scholars now admit that the work of these women was instrumental in influencing the negritude movement. For the African women however, there was no recorded impact felt until 1967 when Flora Nwapa published her first novel Efuru. The publication of Flora Nwapa’s novel Efuru, became the springboard for other women writers in Africa to get involved through their writings.

Prior to the publication of Efuru, the African story had largely been told from the perspective of the African male. It was necessary that at some point, the African woman would become involved in telling the African story from the woman’s perspective. The emergence of women in African literature began to draw the attention of both African men and the international community to the plight of the African woman and girl. Unlike their Anglophone colleagues, francophone women did not appear on the African literary scene until the publication of Mariama Bâ’s novel So Long a Letter in 1981.

Although there seems to be more women lending their voice to the African narrative, there is still a wide gap between the attention paid to African women writers and their male counterparts. Aidoo (1988) is of the opinion that it is more likely to find constructive criticism of male African writers than it is to find of female African writers. This position cuts across all of Africa including francophone Africa. Can we say there are no female francophone African writers? No. the challenge however is that there has been little or no interest in what female writers have to say. Aidoo(1988) while quoting Lloyd Brown says: “African women writers are: the voices unheard, rarely discussed, and seldom accorded the space in their repetitive anthologies and predictably male oriented studies in the field”.

3.0 PREDOMINANT THEMES OF AFRICAN WOMEN WRITERS

Nwapa(1998) notes that it is not that the African woman has not been portrayed in African literature, it is that the portrait presented is often that that suits the writer, who in this case is a man. More often than not, the male
African writer paints the picture of the woman he would like to see and cannot grasp the reality of the African woman as it is. This is often seen in the predominant themes of male and female African writers. In Sembene Ousmane’s Les Bouts de Bois de Dieu, women are portrayed as strong and active in the political scene. They are instrumental to the success of the railway workers’ strike. Ahmadou Kourouma in his work Allah N’est pas Oblige, portrays the woman as a mother and a supportive wife. He tries to address the injustice faced by the woman in her home, but quickly moves on to other matters that are safer to discuss.

African women writers have taken it upon themselves to write the African narrative from a woman’s perspectives. The literatures of African women writers portray the struggles of the African women, her challenges, her weaknesses, the oppositions she faces and virtually every thing that concerns her.

The major themes of African women writers revolve around the family, the corporate world and politics as it relates to women. In Mariama Ba’s novel Une si longue Lettre (So Long a Letter) the story revolves around two women: Ramatoulaye and Aissatou. Both are confronted with situations where they are being forced to bow to patriarchal authority. While Ramayoulaye seems to accept her fate and make the best out of her situation, Aissatou refuses to be restricted by her husband’s authority, thereby taking her destiny in her hands.

Although written decades after Mariama Ba’s Une si Longue Lettre, Fatou Keita’s Rebelle portrays the hypocrisy of patriarchal authority while chronicling the life of a young girl Malimouna. Keita writes about the realities of female genital mutilation, and the price of “rebelling” against societal expectations and norms by young African women.

Aminata Sow Fall’s Jujubier du Patriarche describes the complexities of an african family and how the african woman must navigate the waters carefully if the ship of her home would not copsize. She writes “…l’équilibre de notre monde repose sur les épaules de la femme, du marabout et du griot…” (Aminata Sow Fall, 1998, pp148-149) (...the balance of our world rests on the shoulders of the woman, the marabout and the griot.)

4.0 CONCLUSION

There is still need for more African women writers both in French and English languages. It is recommended that women writers should not be deterred by the seeming non interest in the works of female African writers. As women, we can begin to change the narrative as we take the works of other women and carry out a critique of their works. In the words of Aminata Sow Fall:

…quand j’écris, je n’oppose pas a l’homme, j’écris non pas parce que je suis une femme mais parce que je suis une citoyenne. Je n’écris pas pour montrer aux hommes que les femmes sont aussi capables qu’eux. Nous sommes tous dans la même société et elle a ses nombreuses questions qui se posent. Qu’une femme écrire sur ces problèmes me parait tout naturel.

(When I write, I do not oppose men. I write, not because I am a woman but because I am a citizen. I do not write to show men that women are as capable as they are. We all live in the same society with its numerous questions. That a woman writes on these problems only seems natural).

We must as African women engage ourselves in meaningful and constructive criticism of women writers across Africa, so that we can create awareness about the various issues raised by these writers that affect each of us. In the words of Aduke Grace Adebayo(2009): “We are involved because whether we like it or not, each one of us is involved with a female person as your mother, your daughter, your sister or your wife”

As we begin to show interest in the works of women writers in Africa, it is believed that there will be marked improvement in the participation of other women in telling their stories. There will also be an increased tempo in the interest of governments in Africa to the plight of the woman and the girl child.
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GENDER DIVERGENCE AND EDUCATIONAL TECHNOLOGY INTEGRATION IN SECONDARY SCHOOLS IN OГУН STATE

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ABSTRACT
The introduction of ICT into the educational sector shaped new social stereotypes and gender inequalities. The aim of the study is to determine whether there is a significant relationship between gender and educational technology integration in secondary schools in Ogun State and to determine male and female teachers' perceived usefulness of educational technology. The study is a cross-sectional research and adopted a survey research approach. 50 schools were selected across Ogun State using convenience sampling. The schools selected are mostly situated in urban regions where technology (ICT) is believed to be popular. A structured questionnaire was used as data gathering instrument. Data gathered were analyzed through cross tabulations and chi-square using SPSS version –21. Results showed that there is no significant relationship between gender and the use of computer software /games and internet/social media in secondary schools in Ogun State. The use of computer based educational technology by secondary school teachers in Ogun State is evenly distributed between male and female teachers. Furthermore, the perceived usefulness of computer games/software is higher among female teachers, while the perceived usefulness of internet/social media is higher among the male teachers. This shows that female teachers have improved over the years in integrating educational technology as compared to previous relevant studies. The study therefore recommended that female teachers should be further encouraged in integrating educational technology in their pedagogy, most especially in the area of internet and that secondary school owners including teachers should take educational technology integration a bit further.

Keywords: Computer games/software, Educational technology, Gender, Internet/social media, Technology.

1.0: INTRODUCTION

Technological applications in education have developed in various ways. Computer programs and animations are leading examples of using technological equipment in education (Bamidele & Ayotola, 2013). The issue of integration of technology among teachers in education settings is gaining momentum (Deutsch, 2010). Over the last two decades, computer technology has been shifting many aspects of education including administration both at the lower and higher levels, recruitment, and the manner of instruction and learning. Information Communication Technologies (ICTs) are widely seen as having the potential to contribute positively to educational growth and development and to advance the livelihoods and quality of life of individuals and schools (Chepkonga, 2015). It is inescapable to use these novel technologies such as the internet, video or teleconferencing, mobile phones, IPADs, IPODs, Interactive TV, satellite broadcast, Audio and Video, Slides, CDs, computers etc. to decipher problems in education because the development of technology from day to day is providing improved substitutions to methods by which teaching and learning were hitherto carried out which unvaryingly is reducing the hitches encountered in education (Ahmet & Ahmet, 2008). The success of technology-based instruction practice for learning is largely due to its potential to incorporate different types of media (such as sound, video, graphics, text, etc.) and delivered in several forms including collaboration, interactive, and simulation. Majority of this teaching tool possesses the ability to show the physical phenomenon in a way that students can visualize in a three dimensional form. With these technologies, learning nowadays can be facilitated through different methods other than the traditional teaching and learning method. Such methods include mobile learning, distant learning, virtual learning and computer-based learning, among others (Bamidele & Ayotola 2013).The espousal of technology at secondary and post-secondary institutions has therefore become a vital research topic (Zhou & Xu, 2007).

The argument over the gender variance related to technology adoption started in the 1980s, and it still perseveres in the present day. Many scholars have reexamined this issue and many are persistently doing so. There is a budding interest on the impact of possible gender divergence in technology reception, which
Ezekiel, E. I. & Ezekiel, L. O.

emphasizes the study of gender and novel technologies in education as a significant research theme (Teo, Fan & Du, 2015). The introduction of ICT into the educational sector shaped new social stereotypes and gender inequalities (Markauskaite, 2005). According to Markauskaite, the innovation of the computer has been viewed as a male realm. Volman and Eck (2001) argue that longstanding stereotypic gender differences in attitudes and achievements that hitherto existed in mathematics and technological disciplines were extrapolated to the area of ICT. Several research reviews state that males are more interested in ICT than females and are regular users of computers with more optimistic attitudes about computers and consequently outpace females in ICT mastery (Shapka & Ferrari, 2003).

Technology is growing at a geometric rate and today, educational technology has become more popular than ever (Chepkonga, 2015). Furthermore, study on gender and educational technology integration is not entirely new in academia. Some studies about teacher gender and technology use has indicated the fact that female teachers tend to have infrequent use of computers and/or technology in their pedagogy than their male colleagues, because of their low interest level and their skill (Kay, 2006; Volman & Eck, 2001; Wozney, Venkatesh, & Abrami, 2006; Zhou and Xu, 2007). However, from extant literature review, scarce research evidence exists concerning gender and educational technology integration in Nigerian secondary schools. Hence, the study intends to fill the gap.

The aim of the study is to determine whether there is a significant relationship between gender and educational technology integration in secondary schools in Ogun State and to determine male and female teachers’ perceived usefulness of educational technology. The specific objectives are as follows:

Firstly the study determine whether there is a significant relationship between gender and the use of computer software/games and the use of internet/social media in secondary schools in Ogun State.

The research hypothesis for the study is stated as follows:

Ho₁: There is no significant relationship between gender and the use of computer software/games in secondary schools in Ogun State.

Ho₂: There is no significant relationship between gender and the use of internet/social media in secondary schools in Ogun State.

However, the study is delimited to secondary school teachers in Ogun state. The research borders on gender and educational technology integration secondary schools in Ogun state. The study is a cross-sectional study and limited to 2019. No time series analysis was considered. The study is intended to show gender-technology distribution in secondary schools in Ogun State and determine which gender, if any, needs improvement on educational technology integration towards development.

2.0: LITERATURE REVIEW

2.1: Concept of Educational Technology

The word technology is derived from the Greek word “techno” which means the willingness, skills, knowledge of the way, rule, tools and “logos” which means science, word, learning, mental state (Stosic, 2015). Educational technology is a methodical and organized procedure of applying current technology to advance the quality of education. It can also be referred to as a systematic way of conceptualizing the execution and appraisal of the educational process such as learning and teaching. It comprises of instructional resources, methods and organization of work and relationships such as the behavior of all partakers in the educational process. The term “teaching resources” is frequently used, though they are not synonymous (Potkonjak & Pijanovic, 1996). Educational technology incudes three domains of practice namely: technology as a tutor (computer gives instructions and guides the student), technology as a teaching device and technology as a learning tool. With the application of educational technology, students can independently advance in understanding teaching materials, choose the speed of work and repeat the material that is not satisfactorily clear. Collaborative multimedia content provides a boundless advantage of modern learning over traditional learning. With the application of educational technology we get feedback between the teacher and the student (Stosic, 2015).

2.2: Theoretical Perspectives on Educational Technology Integration

Technology integration theories have been discussed at great length in literature, but gender matters influencing teachers’ technology integration in schools is of current curiosity to education scholars (Teo, Fan & Du, 2015). According to Earle (2002), “wholeness” is an imperative concept and condition for technology integration. Earle posited that when all of the constituents of the system are linked together, the system becomes a “whole”.
Simply offering websites or technology tools, such as multimedia presentation, to students to view and learn on their own would not be considered as integrating technology. The teacher would need to use their inventive pedagogical skills to incorporate technology. Similarly, Williams (2003) defined the integration of technology as engaging technology as an instructional tool to sustain learning and instruction, and technology integration becomes realism when information and communication technology (ICT) have been incorporated into classroom instruction and learning activities. Nonetheless, various factors, such as educational level and experience, experience with technology in educational settings, school teacher’s gender and age, and their views and conduct toward computing technology and its use, can influence the integration of technology into the classroom atmosphere (Schiller, 2003).

The issue of gender variances in the use of technology in the classroom has emerged in a number of research investigations. Some studies about teacher gender and technology use have alluded to the fact that female teachers tend to have infrequent use of ICT in their pedagogy than their male colleagues, because of their interest level and their skill (Kay, 2006; Volman & Eck, 200; Wozney et al., 2006). In a research study on technology mastery and technology experience, Markauskaite (2006) examined gender differences, and found noteworthy gender differences (in favor of the male group) in their ability to work with technology in assignments. Jamieson-Proctor, Burnett, Finger, and Watson (2006) revealed that male teachers were integrating technology into their pedagogy much more than the female teachers. For an improved understanding about how gender issues may influence technology integration in schools, there is the need to comprehend potential gender variances on several important measurements of technology acceptance such as attitude, perceived usefulness, perceived ease of use, and intention for using technology among others.

2.3: Empirical Review

Tao et al. (2015) carried out a study on technology acceptance among pre-service teachers: does gender matter? The study was carried out in China. This study examined possible gender differences in pre-service teachers’ perceived acceptance of technology in their professional work under the framework of the technology acceptance model (TAM). Based on a sample of pre-service teachers, a series of progressively more stringent measurement invariance tests (configural, metric, and scalar invariances, as well as latent mean difference) were conducted. Practically, the findings revealed that, while the gender groups showed no statistical difference on perceived usefulness, attitudes toward technology, intention to use technology, female pre-service teachers had lower scores on perceived ease of use, suggesting that technology use is more challenging for female pre-service teachers than for their male counterparts.

Chepkonga (2015) carried out a study on relationship between principals’ gender and ICT integration in management of public secondary schools, Nairobi, Kenya. The purpose of this study was to find out whether there exists a relationship between the principals gender and ICT integration in management of public secondary schools in Kenya. Cross-sectional survey design was used in Nairobi County where quantitative research strategy was applied for the collection of data using questionnaires. The target population comprised of 75 secondary schools in Nairobi County at the time of data collection. Simple Random sampling was used to select the public secondary schools with 7(10%) participating in the pilot study. Data collected by questionnaires from 68 principals were analyzed using Pearson’s chi square with the help of Statistical Package for Social Sciences (SPSS). The findings of the analysis of data revealed that there was a no significant relationship between the principals’ gender and ICT integration in management of public secondary schools in Kenya.

Efuwape and Aremu (2013) carried out a study on gender differences in acceptability and usability of computer based learning package in electrical and electronics technology in Nigeria. This study investigates gender differences in acceptability and usability of a computer learning package for teaching thermionic emission in electrical and electronics technology. This study adopts a causal comparative research design with the design and development of the learning package. 80 students in 200 Level and ND1 (First Year Students of National Diploma) of the department of Electrical and Electronics engineering and Technology in a University and Polytechnic in Ogun State formed the respondents for the study. 40 students are randomly selected from each school with the total number of 18 females and 62 males. The developed package and 43 questionnaire items were used as data collection tools. The designed and developed package was presented to each student for interaction and later the structured questionnaire (Cronbach alpha = 0.89) was administered to the respondents for data collection. Two research questions were raised and two hypotheses were tested in the study. Data collected were analysed using T-test at 0.05 level of significance. The research findings revealed a non-significant gender difference in both acceptability and usability of the FOSS-based package (df = 78; t = 1.620; p > 0.05 and df = 78; t = 0.668; p > 0.05 respectively). Based on the findings, it is concluded.
that there most likely will not be gender differences in the achievement of males and females using this computer based package.

Zhou and Xu (2007) carried out a study on adoption of educational technology: how does gender matter? The study was carried out in Canada. One of its purposes was to inform our understanding of how gender matters in the process of technology adoption in post-secondary teaching. Gender differences have attracted attention in today’s educational research and practice. Very few studies, however, explore the gender differences in the use of technology in higher education. The authors conducted a study on technology adoption at a large Canadian university. A survey was administered to all full-time faculty and sessional instructors. Results suggest that females were more likely to use student-centered pedagogical approaches in teaching than males. Females had lower confidence and less experience in the use of computers in teaching. They tended to learn how to use technology from others, whereas males were more likely to learn from their own experience.

Bervell, Ahiatrogah, Laryea, and Essilfie (2013) carried out a study on integrating information technology into pedagogy: the gender perspective. The study was carried out in Ghana. This study investigated the seeming gender dichotomy in perception among social studies teachers towards the use of technology in instructional practice in the senior high schools of Cape Coast Metropolis. The theoretical framework of the study are essentialism and social construction. A descriptive research design was adopted and questionnaire used to collect data from a purposive sample of 50 social studies teachers who have completed some form of technology integration training. An independent t-test was computed in analyzing the data at an alpha level of 0.05. The findings revealed a higher mean response for females than males in terms of perception on training, competence and importance of technology integration. The difference was however statistically insignificant (p>0.05). The result depicted a gradual closure of the gender technology gap.

2.4: Theoretical Framework

Technology acceptance model (TAM)

TAM has been found to be useful in explaining user behavior across a broad range of end-user computing technologies and user populations. The relationships between perceived usefulness, perceived ease of use, attitude towards the technology and intention to use technology are specified in the TAM. TAM assumes that an intention to use a particular technology is an important factor that determines whether users will actually utilise it (actual system use). The close association between intention to use and actual use has been supported by research (Yi & Hwang, 2003).

![Figure 2.1: Framework](source: Adapted from Tao, Fan and Du (2015).)

The intention to use is influenced by attitude toward computer use, as well as the direct and indirect effects of perceived usefulness and perceived ease of use. Both perceived usefulness and perceived ease of use jointly affect attitude toward computer use and perceived ease of use has a direct impact on perceived usefulness. Perceived usefulness refers to the degree to which a person believes that using a certain system (e.g. computers)
enhances his/her productivity. In contrast, perceived ease of use is about the extent to which a person thinks that using a system will be relatively free of effort.

3.0: METHODOLOGY

The research design adopted in the study is a cross-sectional research design alongside a survey research approach. Questionnaires were administered to selected respondents (teachers) in secondary schools in Ogun State. The population of study comprises secondary schools in Ogun State. 50 schools were selected across Ogun State using convenience sampling. The schools selected are mostly situated in urban regions where technology (ICT) is believed to be popular.

A structured questionnaire adapted from relevant past surveys was used as data gathering instrument. The questionnaire was divided into two sections. Section A captures demographic characteristics and Section B captures educational technology variables. The reliability of research instrument is outlined below

<table>
<thead>
<tr>
<th>Table 3.1: Item-TOTAL Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Computer Software/Games</td>
</tr>
<tr>
<td>Internet/Social Media</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3.2: Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s Alpha</td>
</tr>
<tr>
<td>.705</td>
</tr>
</tbody>
</table>

From the results above, it is evident that the overall reliability value (Cronbach’s Alpha) is 0.705. This implies that Cronbach’s Alpha value is very high (close to 1) and can be concluded that the research instrument (questionnaire) is very reliable.

Method of Data Analysis

The data gathered through the use of structured questionnaire were analyzed using cross tabulations and chi-square. The Statistical Package for Social Sciences (SPSS) version-21 was used to conduct the above analyses.

4.0: DATA PRESENTATION AND ANALYSIS

4.1: Frequency Statistics for Demographic Variables

<table>
<thead>
<tr>
<th>Table 4.1: Frequency of Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Table 4.2: Frequency for years of experience

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>42</td>
<td>27.6</td>
<td>27.6</td>
<td>27.6</td>
</tr>
<tr>
<td>6-10</td>
<td>44</td>
<td>28.9</td>
<td>28.9</td>
<td>56.6</td>
</tr>
<tr>
<td>Valid 11-15</td>
<td>32</td>
<td>21.1</td>
<td>21.1</td>
<td>77.6</td>
</tr>
<tr>
<td>16+</td>
<td>34</td>
<td>22.4</td>
<td>22.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.3: Frequency for Qualification

<table>
<thead>
<tr>
<th>Qualification</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below NCE</td>
<td>1</td>
<td>.7</td>
<td>.7</td>
<td>.7</td>
</tr>
<tr>
<td>NCE</td>
<td>34</td>
<td>22.4</td>
<td>22.4</td>
<td>23.0</td>
</tr>
<tr>
<td>Degree only</td>
<td>49</td>
<td>32.2</td>
<td>32.2</td>
<td>55.3</td>
</tr>
<tr>
<td>Degree/PGDE</td>
<td>28</td>
<td>18.4</td>
<td>18.4</td>
<td>73.7</td>
</tr>
<tr>
<td>NCE/Degree</td>
<td>40</td>
<td>26.3</td>
<td>26.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

4.2: Crosstabs Output

Table 4.4: Computer Software/Games * Gender

<table>
<thead>
<tr>
<th>Computer Software/Games</th>
<th>Gender</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% within Computer Software/Games</td>
<td>45.1%</td>
<td>54.9%</td>
</tr>
<tr>
<td>% within Gender</td>
<td>48.7%</td>
<td>59.2%</td>
</tr>
<tr>
<td>Count</td>
<td>39</td>
<td>31</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% within Computer Software/Games</td>
<td>55.7%</td>
<td>44.3%</td>
</tr>
<tr>
<td>% within Gender</td>
<td>51.3%</td>
<td>40.8%</td>
</tr>
<tr>
<td>Count</td>
<td>76</td>
<td>76</td>
</tr>
<tr>
<td>Total</td>
<td>Software/Games</td>
<td>50.0%</td>
</tr>
<tr>
<td>% within Gender</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Table 4.4: Chi-Square Tests Computer Software/Games * Gender

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>1.695(^a)</td>
<td>1</td>
<td>.193</td>
</tr>
<tr>
<td>Continuity Correction(^b)</td>
<td>1.298</td>
<td>1</td>
<td>.255</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>1.698</td>
<td>1</td>
<td>.193</td>
</tr>
</tbody>
</table>

Table 4.5: Social Media * Gender

<table>
<thead>
<tr>
<th>Social Media</th>
<th>Gender</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>% within Social Media</td>
<td>58.3%</td>
<td>41.7%</td>
</tr>
<tr>
<td>% within Gender</td>
<td>27.6%</td>
<td>19.7%</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>55</td>
<td>61</td>
</tr>
<tr>
<td>% within Social Media</td>
<td>47.4%</td>
<td>52.6%</td>
</tr>
<tr>
<td>% within Gender</td>
<td>72.4%</td>
<td>80.3%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% within Social Media</td>
<td>50.0%</td>
<td>50.0%</td>
</tr>
<tr>
<td>% within Gender</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>1.310(^a)</td>
<td>1</td>
<td>.252</td>
</tr>
<tr>
<td>Continuity Correction(^b)</td>
<td>.910</td>
<td>1</td>
<td>.340</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>1.315</td>
<td>1</td>
<td>.251</td>
</tr>
</tbody>
</table>

4.3: Hypothesis Testing

Hypothesis 1

The null hypothesis states there is no significant relationship between gender and the use of computer software/games in secondary schools in Ogun State. From the chi-square test for computer software/games above, the p-value is 0.193. At a 0.05 level of significance, we do not reject the null hypothesis and conclude that there is no significant relationship between gender and the use of computer software/games in public secondary schools in Ogun State.

Hypothesis 2

The null hypothesis states there is no significant relationship between gender and the use of internet/social media in secondary schools in Ogun State. From the chi-square test for internet/social media above, the p-value is 0.252. At a 0.05 level of significance, we do not reject the null hypothesis and conclude that there is no significant relationship between gender and the use of internet/social media in public secondary schools in Ogun State.
4.4: Interpretation of Results

From the chi-square test for computer software/games above, the p-value is 0.193. At a 0.05 level of significance, we do not reject the null hypothesis and conclude that there is no significant relationship between gender and the use of computer software/games in secondary schools in Ogun State. From the crosstab, it is evident that the use of computer software/games is near even distribution as 45.1% of those that use computer software/games are male while 54.9% of those that use computer software/games are female. However, the perceived usefulness of computer games/software is a bit higher among female teachers. Furthermore, from the chi-square test for internet/social media above, the p-value is 0.252. At a 0.05 level of significance, we do not reject the null hypothesis and conclude that there is no significant relationship between gender and the use of internet/social media in secondary schools in Ogun State. From the crosstab, it is evident that the use of internet/social media is near even distribution as 58.3% of those that use internet/social media are male while 41.7% of those that internet/social media are female. However, the perceived usefulness of internet/social media is a bit higher among male teachers.

It is clear from the findings that the use of both computer games/software and internet/social media by secondary school teachers in Ogun State is evenly distributed between male and female teachers. This findings refuted the studies carried out by Kay, 2006; Volman and Van Eck, 2001; Wozney, Venkatesh, and Abrami, 2006; Zhou and Xu 2007 which alluded to the fact that female teachers tend to have less use of computers and/or technology in their pedagogy than their male counterparts, because of their more limited access to technology, their interest level, and their skill. This shows that female teachers have improved over the years in integrating educational technology. Nonetheless, only 46.1% of respondents use computer games/software. The implication of this is that, educational technology has not been well integrated by teachers in secondary schools in Ogun State in the area of computer games/software. However, the use of internet/social media is quite popular among secondary school teachers in Ogun state as 76.3% of respondents make use of it.

5.0: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

The findings of the study are summarized as follows:

There is no significant relationship between gender and the use of computer software/games in public secondary schools in Ogun State. Also, there is no significant relationship between gender and the use of internet/social media in public secondary schools in Ogun State.

The use of both computer games/software and internet/social media by secondary school teachers in Ogun State is evenly distributed between male and female teachers. It is also observed that the perceived usefulness of computer games/software is a bit higher among female teachers, whereas the perceived usefulness of internet/social media is a bit higher among male teachers.

Educational technology has not been well integrated by teachers in secondary schools in Ogun State in the area of computer games/software. Only 46.1% of respondents use computer games/software. However, the use of internet/social media is quite popular among secondary school teachers in Ogun State as 76.3% of respondents make use of it.

The findings of the study refuted the studies carried out by Kay, 2006; Volman and Van Eck, 2001; Wozney, Venkatesh, and Abrami, 2006; Zhou and Xu 2007 which alluded to the fact that female teachers tend to have less use of computers and/or technology in their pedagogy than their male counterparts, because of their more limited access to technology, their interest level, and their skill. This shows that female teachers have improved over the years in integrating educational technology at secondary school level.

It is evident that female teachers have improved over the years in integrating educational technology at secondary school level. The study recommended that female teachers should be further encouraged in integrating educational technology in their pedagogy, most especially in the area of the use of internet. Furthermore, only 46.1% of respondents use computer games/software. The implication of this is that, educational technology has not been well integrated by teachers in secondary schools in Ogun State in the area of computer games/software. The study recommended that secondary school owners and teachers should improve in this area.

REFERENCES


1st National Conference of WITED, Ilaro Chapter


STUDY OF THE PHYSICO-CHEMICAL CHARACTERISTICS OF INDUSTRIAL EFFLUENTS FROM A BREWERY INDUSTRY IN OGUN STATE, NIGERIA

Oluwafisayomi M. Babatola & Comfort P. Ajibode

Department of Science Laboratory Technology
The Federal Polytechnic, Ilaro.

ABSTRACT
Water plays an important role in the life of human beings. In the last few decades, limitless urbanization has caused a serious pollution problem due to the disposal of sewage to the water bodies. This study investigates the level of wastewater pollution by analyzing its chemical characteristics at five wastewater collectors. In this investigation physico-chemical parameters such as colour, temperature, total alkalinity, chloride, total hardness, total suspended solid, pH, dissolved oxygen and heavy metal determination using Atomic Absorption Spectrophotometer (AAS). Experimental results show that the concentration levels of the some parameters does not conform to the guide line stipulated by Federal Environmental Protection Agency (FEPA). Concentration ranges as follows: temperature (45-33°C), pH (11.24-9.15), Total Alkalinity (1500-190mg/L), Total suspended solid (39.6-38.3mg/L). Chloride and total hardness conformed to FEPA standards with their respective range of values (82-30mg/L), and (80-110mg/L). Dissolved oxygen (2.0-3.4mg/L) fall below standard. The trace metals concentration range as follows: Iron (23.5-24.1mg/L), Cu (0.26-0.24), Zn (2.24mg/L) and Cd (0.00), Iron and zinc fall beyond FEPA standard which are 20.0 and 0.1mg/L respectively while copper conform with the standard. Cadmium is not detectable.

Keywords: Effluent, Physicochemical, Heavy Metals and Brewery.

1. INTRODUCTION
Industrialization is an important tool for the development of any nation. Consequently, the industrial activity has expanded so much all over the world. Today, it has become a matter of major concern in the deterioration of the environment (Nivruti et al., 2013). Water is one of the most valuable natural resource for all living creatures on the earth and essential for the sustenance of life as exemplified by its diversified uses such as drinking, cooking, washing, irrigation, farming, industrial activities etc. Water may be contaminated by various means that may be chemically or biologically and may become unfit for drinking and other uses. Domestic wastewater contains a large amount of organic matter, nitrate, phosphate, detergents, inorganic salt, oil etc. (Rathore et al., 2014).

Pollution from industrial disposal and effluent discharges is becoming a serious environmental issue in many developing countries of Africa (Uzoukwu et al., 2004). The use of dams polluted by industrial effluents from textiles, shoes, cosmetics, plastics, and other household industrial consumables has its negative consequence on the plants through the alteration of the physico-chemical properties of the receiving water body. The aquatic habitats are killed by the toxic chemicals with the resultant disruption of the aquatic ecosystem and its food chain. The decomposition of the organic materials by micro-organisms in the aquatic ecosystem leads to the lowering of the level of dissolved oxygen, which in turn inhibits the growth or cause the death of the aquatic habitats (Onuegbu, 2008). The biochemical oxidation of the natural and the industrial wastewater can be represented by the following equation: Oxidizable material + bacteria + nutrient + O₂ → CO₂ + H₂O + oxidized inorganic(s) (Aleksandar et al., 2011)

There is therefore every need to carry out a research to find out the elements and compounds present in the effluents of Brewery industries. The results of the analysis of these effluents will reveal the presence and concentrations of these pollutants. The contents and their concentrations will be compared with a reference standard and if found to be unsafe, recommendations will be made on the proper way of disposing the effluent such that it will not be harmful to life (Adriano, 2001).

The term effluent can be defined as liquid waste flowing out of a factory, farm, commercial establishment, or a household into a water body such as a river, lake, or lagoon. In various under-developed countries, untreated sewage and industrial effluents are utilized for the cultivation of crops and vegetables. It is a common practice in
Nigeria where farmers suppose it to be a source of irrigation and nutrients for cultivation while administrators assume it as a low cost method of disposal (Ahmed, 2000; Ahmad, et al. 2003).

The aim of this study is to analyze the physicochemical compounds and heavy metal concentrations in the effluents generated by a brewery industry in Ogun state, Nigeria. The results from the analyses will be compared with reference standards to ascertain its compliance with regulatory standards.

2. MATERIALS AND METHODS

2.1 Collection of Sample

The effluent samples were collected from the 3 different points of discharge of the company; the source of effluent, the middle course and point of discharge into the municipal drain. The samples for the dissolved oxygen were collected in 300ml BOD bottles avoiding contact with air and fixed on the spot, while samples for the physicochemical parameters were collected with plastic bottles pre-cleaned by washing with non-ionic detergents and rinsed with tap water.

2.2 Physicochemical Analysis

All field meters and equipment were checked and calibrated according to the manufacturer’s specification. pH, temperature, transparency and depth were determined while on site. Other parameters including heavy metals were analyzed in the laboratory.

2.3 Determination of pH

Method: pH was measured by electrometric method using laboratory pH meter model 31500 (expressway).

Procedure
The electrodes were rinsed with distilled water and blot dry. The pH electrodes were then rinsed a small beaker with a portion of the sample. Sufficient amount the sample was poured into a small beaker to allow the tips of the electrodes to be immersed to a depth of about 2cm. The electrode was at least 1cm away from the sides and bottom of the beaker. The temperature adjustment dial was set accordingly.

The pH meter was turned on and the pH of the sample recorded.

2.4 Determination of Water Hardness

Method: Hardness was measured according to APHA standard method.

Procedure
50cm³ of the water sample was introduced into a beaker and 1cm³ buffer solution of NH₃ added. Three drops of solocrome Black T indicator was also added and the solution swirled properly. The mixture was titrated with 0.01 EDTA solution until it changed from wine red to pure blue with no bluish tinge remaining. The total hardness of the water sample was calculated.

Total hardness CaCO₃ mg/L = \( \frac{\text{Volume of titrant} \times 100}{\text{Volume of sample (ml)}} \)

2.5 Determination of Chloride

Method: Chloride was analyzed according to APHA standard method.

Procedure
A 100ml of the clear sample was pipetted into an Erlenmeyer flask and the pH adjusted to 7-10 with either H2SO4 or NaOH solution. Then 100ml of K2CrO₄ indicator solution was added with standard solution of AgNO₃ in a permanent reddish brown coloration. The AgNO₃ titrant was standardized and a reagent blank established. A blank of 0.2-0.3ml was usually used.

Calculation;
Chloride concentration = Titre value (x) × 10 = 10xmg/l.

2.6 Determination of total alkalinity

Method: Hardness was measured using standard analytical method of APHA
Procedure

100ml of the waste water sample was placed transferred into a conical flask 2 drops of phenolphthalein indicator was added and then titrated with the standard HCl until the pink colour just disappears. The titre value was noted as phenolphthalein at point (p).

To the above solution 3 drops of methyl orange indicator was added and the titration is continued until a sharp color change from yellow to red took place. The total titre value from the beginning of the experiment is recorded as methyl orange end – point M.

Calculation

\[ 2(P) = CO_3^- \text{ and } (M) - 2(P) \text{ should correspond to } HCO_3^- \]

This value of N/50 HCl equivalent to HC0_3^- = (M) – 2(P)

2.7 Determination of dissolved oxygen

Method: Hardness was measured using standard analytical method of APHA

Procedure

The water is collected in a 300ml BOD bottle avoiding contact with air. 2ml of MnSO_4 and 2ml of alkaline iodide azide reagent were added in such a way that the tip of the pipette should dip below the liquid surface while adding the reagent. The bottle is stoppered and mixed by inverting the bottle 3-4 times. 1ml of conc. H_2SO_4 was added and mixed well till the precipitate went into solution.

230ml of the clear solution is measured into a conical flask and titrated against standard sodium thiosulphate solution using starch as indicator toward the end point.

NOTE: 203ml taken for titration will correspond to 200ml of the original sample. This is to allow for correction to 2ml MnSO_4 and 2ml alkali iodide-azide reagent.

\[ \frac{200 \times 100}{230 - 4} = 203 \text{ ml} \]

Calculation

1ml of 0.05M Na_2S_2O_3 = 2mg of DO/litre

xMl of 0.05M Na_2S_2O_3 = X x 2mg of DO/litre

2.8 Determination of total suspended solids

Method: Hardness was measured using standard analytical method of APHA

Procedure

100ml of water samples was accurately measured into 250ml evaporating dish and transferred to the stream bath. Evaporated to dryness and dried at 105°C for 1 hour in the oven. It was then cooled in the desiccator and weighed. The change in weight from the original weight of a cleared empty evaporating dish pre-ignited and cooled and noted.

Calculation

\[ \text{Total solids (mg/L)} = \frac{(X-Y)\times 1000 \times 100}{\text{Volume of sample (ml)}} \]

X = Weight of sample and evaporating dish

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2.9 Determination of temperature

Method: Hardness was measured using standard analytical method of APHA

Procedure

Temperature was measured in-situ on the body of the waste water by the use of mercury in glass thermometer. The bulb of the thermometer was dipped inside the water and the reading was taken when the mercury thread become stable. The unit is in degree centigrade.

2.10 Determination of metals

Sample preparation

The method used is instrumental method;

200ml of well mixed sample solution was measured into a clean 250ml evaporating dish. 2ml of concentrated nitric acid was introduced into the sample solution and was evaporated on the water bath to less than 20ml. The digested sample was further made to 20ml. The digested sample was further made to 20ml mark and stored in pre-cleaned 50ml syrup bottles for analyses. This procedure was repeated for the blank but with distilled water. The metal content was determined by Perkin Elmer Atomic spectrophotometer metals determined by Perkin Elmer AAS include Fe, Cu, Zn and Cd.

3. RESULTS AND DISCUSSION

This study shows the comparative analyses of physicochemical parameter of wastewater from Sona breweries were. The physicochemical parameters under study were the temperature, pH, TSS, total hardness, total alkalinity, dissolved oxygen and Chloride. The physico-chemical parameters of the effluents investigated are presented in Table 1.

3.1 Water Temperature

In the present study the water temperature ranged from 33°C to 45°C, although there was a light shower during the collection sample which was done at around 12 noon. The temperature at the first point (45°C) is a bit higher than the FEPA 1991 standard < 40°C while the other values conform to it. Temperature is one of the most significant factors that affect the aquatic environment (Wegar et al., 2012). Hariharan (2010) reports that biochemical reactions of aquatic organisms are temperature dependent. Increase in temperature of water body will promote chemical reactions in the water.

3.2 pH

pH is the hydrogen ion activity and a measure of acidity and alkalinity in aquatic bodies. pH is one of the important biotic factors that serves as index for pollution (Sagar et al., 2012). The pH values range from 11.24 to 9.15 which is higher than the FEPA standard. The water is too basic which could be attributed to high concentration of carbonates in the water. The principal component regulating ion pH in natural waters is the carbonate, which comprises CO₂, H₂CO₃, and HCO₃⁻ (Kataria et al., 1996).

3.3 Hardness

The hardness of water is not the chemical parameters but indicates the water quality mainly in terms of Ca and Mg and expressed as CaCO₃. The hardness has no known adverse effect. It is property of water of which prevents the lather formation with the soap (Tekade et al., 2011). Water containing CaCO₃ at low concentrations below 60mg/L is generally considered as soft; 60-120mg/L is moderately hard; 120-180mg/l is hard; and more than 180mg/l is very hard (McGowan, 2000). The water hardness ranges from 80-110mg/L and therefore can be categorized as moderately hard water and can be removed by boiling.
3.4 Alkalinity
High alkalinity is a measure of wastewater strength. It shows the capacity of wastewaters to neutralize acids, and is undesirable. The alkalinity of water may be caused due to OH$^-\$, CO$_3^{2-}$, HCO$_3^-$ ions. Alkalinity is the estimate of ability of water to resist change in pH upon addition of acid (Tekade et al., 2011). The alkalinity of the water reduced from the point source to the gate.

The high value of alkalinity indicates the presence of major sources of CO$_3^{2-}$ from the acid used to clean and disinfect brewery. The situation which is undesirable for intended use of water.

3.5 Chloride

The presence of chloride in natural water can be attributed to the salt deposits, discharge of effluents from chemical industries, sewage discharges etc. Each of these sources may cause the local contamination of both surface and ground water (Tekade et al., 2011). Chloride content in the studied effluent was found to be between 30mg/L to 82mg/L. This level of chloride content is below the FEPA standards.

3.6 Dissolved Oxygen

Dissolved oxygen is of significant importance to the respiration activities of the aquatic organisms and effluents with very low DO may have a negative impact on the sustainability of the rivers in the basin (Tekade et al., 2011). The DO values increases from point 1 to point 3 ranging from 2.0mg/L-3.4mg/L which is very low hence a lot of oxygen has been used up. The presence of free oxygen in water is an indication of the ability of that water to support biological life. Low value of DO may be due to higher water temperature and increased activity of microorganisms in the water which consumes a lot of oxygen due to metabolic process and the decomposition of organic material (Sahni et al., 2012). Decrease in DO will lead to increases in BOD and COD values (Siyanbola, et al., 2011).

3.7 Total Suspended Solids

Total dissolved solids are a measure of total inorganic substances dissolved in water. The total suspended solids affect the light intensity of water; suspended solids are the cause of suspended particle inside the water body influencing turbidity and transparency (Tekade et al., 2011). Total suspended solids content in this study was found to be between 39.6mg/L to 38.1mg/L. This level of chloride content is below the FEPA standards.

<table>
<thead>
<tr>
<th>Effluent Points</th>
<th>Temp ($^\circ$C)</th>
<th>pH</th>
<th>Total Hardness (mg/L)</th>
<th>Total Alkalinity (mg/L)</th>
<th>Chloride (mg/L)</th>
<th>Dissolved Oxygen (mg/L)</th>
<th>Total Suspended Solids (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point 1</td>
<td>45</td>
<td>11.24</td>
<td>80</td>
<td>1500</td>
<td>82</td>
<td>2.0</td>
<td>39.6</td>
</tr>
<tr>
<td>Point 2</td>
<td>38</td>
<td>9.88</td>
<td>90</td>
<td>460</td>
<td>42</td>
<td>2.4</td>
<td>38.1</td>
</tr>
<tr>
<td>Point 3</td>
<td>33</td>
<td>9.15</td>
<td>110</td>
<td>190</td>
<td>30</td>
<td>3.4</td>
<td>28.3</td>
</tr>
</tbody>
</table>

This study shows the comparative analyses of the concentration of metals of the effluent from Sona breweries. The metals studied include iron (Fe), copper (Cu), zinc (Zn) and cadmium (Cd). Table 2 shows the concentration of metals from the various effluent points.

Iron (Fe) metal concentration values ranges from 23.0mg/L-24.1mg/L which is higher than the FEPA (1991) recommended concentration level (20mg/L). Zinc (Zn) however at the first point has a higher concentration value (2.24mg/L) which is higher than the FEPA (1991) recommended level (<1), which can be attributed to wort which is a major raw material in beer productions and could also be attributed to Zn used in electroplating storage materials and boilers. All the other points conform to the FEPA (1991) level.

Copper (Cu) values ranges from 0.24mg/L- 0.26mg/L which falls between the FEPA (1991) limit. Cadmium (Cd) shows insignificant contribution in the effluent as it was not detected. Matsuo et al. (1995) report that high concentration of Cadmium inhibits bio-uptake of Phosphorus and Potassium by the plants.

<table>
<thead>
<tr>
<th>Effluent Points</th>
<th>Fe (mg/L)</th>
<th>Cu (mg/L)</th>
<th>Zn (mg/L)</th>
<th>Cd (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point 1</td>
<td>23.5</td>
<td>0.26</td>
<td>2.24</td>
<td>ND</td>
</tr>
<tr>
<td>Point 2</td>
<td>23.0</td>
<td>0.24</td>
<td>0.24</td>
<td>ND</td>
</tr>
<tr>
<td>Point 3</td>
<td>24.1</td>
<td>0.25</td>
<td>0.24</td>
<td>ND</td>
</tr>
</tbody>
</table>

ND: Not Detected
4. CONCLUSION

This study has shown that the brewery industry discharge effluents with high degree of alkalinity value which are not in compliance with FEPA set standards. This questions the functionality of the treatment plants in this company. Should these companies continue to discharge untreated wastes into the environment thereby building up in the metal concentrations of the water bodies and which may pose serious threat to both the aquatic habitat and human beings that consume these aquatic animals? Strict environmental laws become imperative so as to curb this stress.

REFERENCES


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COMPARATIVE ASSAY OF WAXES FROM CASSAVA AND SUGARCANE BAGASSE

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ABSTRACT

Extraction of products of high value from agricultural wastes is an essential component for sustainable technoeconomic development. In this study, extraction of wax from cassava and sugarcane bagasse was carried out using a mixture of benzene and methanol (mass ratio of 2:1) as the extraction reagent. About 9.86% (w/w) of crude cassava wax and 4.10% (w/w) of sugarcane bagasse wax. The physicochemical properties and characterisation was compared for both waxes. Results of fourier transform-infrared spectroscopy (FT-IR) showed prominent peaks at CH, CH$_2$, C=O and OH indicating the presence of alkanes, carbonyls and alcohol, respectively for both waxes. Ultraviolet (UV) qualitative analysis revealed that the waxes absorbed UV light at 245 nm and 215 nm for cassava and sugarcane bagasse wax, respectively, indicating the presence of conjugated dienes. In addition, the physicochemical properties of the cassava and sugarcane bagasse wax evaluated were; melting point (62.5°C and 76°C), saponification value (275 mg/KOH/g and 202.6 mg/KOH/g), acid value (29.15 mg/KOH/g and 6.7 mg/KOH/g), ester value (245.85 and 180.06), free fatty acid (14.66 mg/KOH/g and 3.45 mg/KOH/g) and iodine value (22.54 mg/KOH/g), respectively. Thus, cassava and sugarcane bagasse wax have potential for various applications in the industry such as food preservative, medicinal and has several biological and industrial importance.

Keywords: Cassava bagasse, sugarcane bagasse, extraction, wax, agricultural wastes.

1.0 INTRODUCTION

Renewable organic matters are of enormous concern as a result of its sustainability and biodegradability (Travalini, Pretes, Pinheiro & Demiate, 2017). Waxes are a distinct class of organic compounds that are lipophilic, malleable solids near ambient temperatures. They include higher alkanes and lipids, typically with melting points above 40°C (Aro & Aletor, 2012). Waxes are insoluble in water but soluble in organic, non-polar solvents. Natural waxes of different types are produced by plants and animals and occur in petroleum. Waxes are organic compounds that characteristically consist of long alkyl chains. They may also include various functional groups such as fatty acids, primary and secondary long chain alcohols, unsaturated bonds, aromatics, amides, ketones, and aldehydes (Bhosale, Chonde & Raut, 2012). They frequently contain fatty acid esters as well. Wax is synthesized by many plants and animals. Synthetic waxes are often long-chain hydrocarbons (alkanes or paraffins) that lack functional groups. Those of animal origin consist of wax esters derived from a variety of carboxylic acids and fatty alcohol. In waxes of plants origin, characteristic mixture of unesterified hydrocarbon may predominate over esters (Anam & Gathuni, 2014).

Crop residues such as cassava bagasse are annually renewable sources of energy. Though they are rich in carbohydrate, their utilization for any direct application is very less due to the low content of protein and poor digestibility (Pallar, Eläkkïya, Tennety & Devip, 2012). However, the utilization of such agro-industrial residues provides alternative substrate for bioprocesses and will solve the problem of environmental pollution to an extent. Several processes have been developed to utilize cassava bagasse, the fibrous residue of the tropical tuber for the production of value added products such as organic acids, ethanol, aroma, mushroom among others (Bekele, Desalegn & Mitiku, 2015).
Sugarcane can produce epicuticular wax on the stems and leaves. Sugarcane bagasse is one of the major lignocellulosic biomass in tropical countries. In general, approximately 270 kg of bagasse (with 50% moisture) is produced from one metric ton of sugarcane (Gaoxiang, Fen, Lian, Xiaoqing, Chao, Hailong, Xuefang & Xinde, 2016). Sugarcane bagasse, the major by-product of the sugarcane industry, is a very promising raw material for the production of glucose, xylose, ethanol and methane (Hofsetz & Silva, 2012). There are increasing indiscriminate disposal of these agro-waste on land and water bodies causing changes in the physical, chemical and biological integrity of the environment, thereby creating nuisance in the environment such as producing foul smell and breeding various types of infectious organisms which affects human and its environment, therefore this study was aimed at comparing the properties of waxes obtained from cassava and sugarcane bagasse.

2.0 MATERIALS AND METHODS

Sample Collection

Cassava bagasse samples were amassed from the cassava processing factory in Ilaro. The bagasse was oven-dried at 60°C for 24 hours. Sugarcane bagasse was collected from sugarcane farm at Papalanto in Ogun State, the agro-waste was oven dried at 60°C for 24 hours. The dried samples were crushed in a mill, packed in polyethylene bags and stored at room temperature for further use. All reagents used were of analytical grade.

Extraction of Wax

Wax was extracted from the bagasses as reported by Mangesh & Lele (2012). The process comprises of soxhlet extraction of bagasse powder with methanol and benzene using ratio 1:2 for 8–10 hours. The solvent was then recouped using rotary evaporator RE300. The residue was dissolved in isopropanol and was refluxed with charcoal for 1-2 hours to remove any undesirable colour or pigments present. The extract was then filtered to remove charcoal and evaporated at 60°C to obtain crude wax.

Percentage Yield (%)

The dried bagasses were weighed before dewaxing and the waxes produced were also weighed to calculate the yield using the equation below:

\[
\text{Crude Yield} = \left(\frac{\text{Mass of the crude wax}}{\text{mass of sample}}\right) \times 100\%
\]

Physicochemical Parameters of Extracted Wax

The physicochemical analysis of the waxes extracted were carried out using the method described by (Anuj, Yuvraj, Veena & Nishi, 2013).

Acid Value Determination

5.0g of wax was weighed into a dry conical flask of suitable size and 25ml of absolute ethanol was added and 2 drops of phenolphthalein indicator was added to the mixture. The mixture was then heated with shaking in water bath (65%) for 10 minutes and cooled. The cooled mixture was titrated against 0.1 N KOH solution until pink colour appeared (endpoint). The acid value and free fatty acid was calculated as:

\[
\text{Acid value} = \frac{56.1 \times N \times V}{W}
\]

Where, \(V\) = Volume of 0.1 N KOH solution used (mL)

\(N\) = Normality of KOH solution (determined by standardizing KOH solution with oxalic acid)

\(W\) = Weight of oil sample (g)
Free Fatty Acid= Acid value x 0.503

**Saponification Value Determination**

2 g of the wax sample was weighed into a 250ml conical flask, and 25ml of alcoholic potassium iodide was added and dissolved in 250ml. A reflux condenser was attached and the flask content was heated on a boiling hot water for 1 hour with occasional shaking, while the solution was still hot, 3 drops of phenolphthalein indicator was added and then titrated with 0.5 N HCl. The same procedure was used for a blank (without the wax). The saponification value was calculated thus;

\[
\text{Saponification value} = \frac{56.1 \times N \times (B-S)}{W}
\]

Where B = Volume of 0.5 M HCl solution used for the blank (mL)
S = Volume of 0.5 M HCl solution used for the oil sample (mL)
M = Molarity of HCl
W = Weight of oil sample (g)

**Ester Value**

Ester value was determined by the difference between the saponification value and the acid value and it showed the amount of potassium hydroxide consumed in the saponification of the esters.

\[
\text{Ester Value} = \text{Saponification value} - \text{Acid value}
\]

**Iodine Value Determination**

2 g of the wax was weighed into a 250ml conical flask and 10ml of chloroform was added. 30ml Hannus solution was added, the flask was closed completely by parafilm and the solution was left for 30 minutes with shaking continuously. 10ml of 15% Potassium iodide was added and 10ml of distilled water was added. The iodine solution was titrated against 0.1N sodium thiosulphate solution using starch as an indicator. The same procedure was used for a blank (without the wax). The iodine value was calculated as;

\[
\text{Iodine value} = \frac{12.69 \times N \times (B-S)}{W}
\]

Where B = Volume of sodium thiosulphate solution used for the blank (mL)
S = Volume of sodium thiosulphate solution used for the oil sample (mL)
N = Normality of sodium thiosulphate solution
W = Weight of oil sample (g)

**Melting Point of Extracted Wax**

The melting point of the waxes were carried out according to the method adopted by Bekele et al. (2016). The wax was melted by warming it in water bath at a temperature just sufficient to melt it and the melting points were determined by the capillary tube method.

**Characterisation of Waxes**

The characterization of the waxes extracted was carried out using Fourier transformed infrared spectroscopy (FT-IR) and Ultraviolet-Visible spectroscopy (UV-Vis).
3.0 RESULTS AND DISCUSSION

The physicochemical properties of the waxes are presented in Table 1 while the results of FT-IR and UV spectrum are presented in Figure 1-4.

The cassava bagasse was observed to have a higher concentrate of wax based on the percentage yield which was found to be 9.86% as compared to sugarcane bagasse whose yield was distinctively low (4.10%) although it is high when compared to the wax obtained by Gaoxiang et al., 2016 (1.2%) and 0.53% obtained by Attard, McElroy, Rezende, Polikarpov, Clark & Hunt, 2015, the high yield of wax from cassava bagasse is dependent on the source sample.

Results of the physicochemical parameter of the waxes extracted from cassava bagasse wax (CBW) and sugarcane bagasse wax (SBW) are shown in Table 1 below. The Table presents the physical (colour, odour, state, nature and melting point) and chemical (acid value, saponification value, ester value and iodine value) characteristics of the waxes. They both have an agreeable odour and are viscous liquids at room temperature.

The melting point of a wax is the temperature at which the wax changes from a solid to a liquid state. The melting point of the waxes were 62.5°C and 76°C for cassava and sugarcane bagasse wax respectively, which was still within same range, this signifies that these waxes are clear of foulness and can be used for various purposes.

The acid value is the amount of KOH milligrams required to neutralize the free acidity present in one gram. It is a relative measure of rancidity as free acidity is normally formed during decomposition of glycerides (Bekele et al, 2016).

The acid values obtained are 29.15 mg/KOH/g and 6.7 mg/KOH/g for cassava and sugarcane bagasse wax respectively, the acid value obtained for cassava bagasse wax falls within the range of acid value for beeswax while the acid value of sugarcane bagasse wax falls within the range of Carnauba wax (Akoh & Min, 2002).

The saponification value (number) is the number of milligrams potassium hydroxide required to hydrolyze 1 g of the sample and it measures the amount of saponifiable matter present. Testing saponification value indicates the number of acids and ester group found in the waxes (Bernal, Jimenez, Delnozal, Toribio & Martin, 2005). The saponification values obtained was 275 mg/KOH/g and 202.6 mg/KOH/g for cassava and sugarcane bagasse waxes, respectively. Both waxes exceeded the international standard of saponification value for beeswax (Bekele et al., 2017).

The ester value of wax determined by the difference between saponification value and acid value which indicates the amount of KOH consumed during saponification of esters (Bekele et al., 2017). The ester value obtained was 245.85 mg/KOH/g for cassava bagasse and 180.06 mg/KOH/g for sugarcane bagasse. The ester value of both samples exceeded the international limit for beeswax which could be attributed to the type of solvent used.

The iodine value is expressed as the grams of Iodine absorbed per 100g of lipid it indicates the degree of unsaturation. The greater the iodine value, the greater the number of C=C double bonds. An increase in iodine value indicates high susceptibility of liquid to oxidative rancidity due to high degree of unsaturation. The iodine value obtained in this study for both waxes was 22.54 g/100. This is similar to the iodine value for wool grease and lanolin.
Table 1. Physicochemical parameters of crude bagasse wax

<table>
<thead>
<tr>
<th>Physicochemical parameter</th>
<th>CBW</th>
<th>SBW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Pale brown</td>
<td>Yellowish Brown</td>
</tr>
<tr>
<td>Acid value (mg/KOH/g)</td>
<td>29.15</td>
<td>6.7</td>
</tr>
<tr>
<td>Saponification value (mg/KOH/g)</td>
<td>275</td>
<td>202.6</td>
</tr>
<tr>
<td>Ester value (mg/KOH/g)</td>
<td>245.85</td>
<td>180.06</td>
</tr>
<tr>
<td>Percentage yield (%)</td>
<td>9.86</td>
<td>4.10</td>
</tr>
<tr>
<td>Iodine value (g/100)</td>
<td>22.54</td>
<td>22.54</td>
</tr>
<tr>
<td>Free fatty acid</td>
<td>14.66</td>
<td>3.45</td>
</tr>
<tr>
<td>Melting point (°C)</td>
<td>62.5</td>
<td>76</td>
</tr>
</tbody>
</table>

**FT-IR Analysis Results**

Wax is a mixture of long chain aldehydes, long chain primary alcohols, fatty acids, hydrocarbons and esters. Following the extraction of the native waxes, spectroscopic study was carried out to examine its chemical composition. FTIR analysis of the wax samples revealed the presence of many organic functional group present in the waxes indicating their respective compounds. Comparison of the absorption frequency of various organic functional group revealed bands at 2911 cm⁻¹ and 2919 cm⁻¹ for cassava bagasse and sugarcane bagasse, respectively, this is characteristic of -CH stretch and bend, whereas bands at 1028 cm⁻¹ and 1464 cm⁻¹ for cassava bagasse wax and 1019 cm⁻¹ and 1464 cm⁻¹ for sugarcane bagasse wax signify CH₂ and CH₃ bands. Bands at 3382 cm⁻¹ and 3349 cm⁻¹ for cassava and sugarcane bagasse wax, respectively, indicated the presence of OH group in the wax samples. Similarly, bands at 1717 cm⁻¹ for cassava bagasse wax and 1708 cm⁻¹ for sugarcane bagasse wax were attributed to the presence of carbonyl group. Similar results were detected in the characterisation of sugarcane bagasse as reported by Mangesh & Lele (2012). According to Gaoxiang et al. (2016) the FTIR characterisation of sugarcane bagasse revealed the presence of many functional group such as alkanes, alcohol, fatty acids, aldehyde and small amount of lignin derivatives.
UV-Vis Analysis Results

Fatty acids, conjugated dienes, and hydroperoxide developed as a result of lipid oxidation and absorb UV light at about 230nm. In the UV region (100-400nm), cassava bagasse wax exhibited a maximum wavelength of absorption at 245nm while sugarcane bagasse wax indicated a maximum wavelength of absorption at 218nm, this connote the presence of conjugated dienes and trienes. Mangesh & Lele (2012) reported a close landermax of 230nm. The result was also in accordance with Athukorala, Mazza, & Oomah, 2009 where wax from (Linumusitatissium) strax has shown a similar pattern.
4.0 CONCLUSION

The crude waxes obtained from cassava bagasse and sugarcane bagasse were found to exhibit many classes of compound like alkanes, ester, alcohol and fatty acids in the crude wax. The major components of wax, is sec butyl isothiocyanates which has many beneficial effects that can be utilized for medicinal purposes. Fatty acids playing significant role in human were found to be present in wax. Apart from the medicinal and nutritional
applications, wax can be used in food preservation as an edible coating for fruits and vegetables. Although, the wax obtained from the sugarcane bagasse was low (4.10%) compared to cassava bagasse wax (9.86%), both waxes have many compounds of biological and industrial importance therefore wax extracted from both waste products would be a potential alternative raw material for industries and help to minimize its deterioration to the environment.

REFERENCES


FUNCTIONAL PROPERTIES OF PROTEIN ISOLATES FROM THE SEEDS OF Delonix Regia (FLAME OF THE FOREST) AND Lonchocarpus Sericeus (SENEGAL LILAC)

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ABSTRACT

The functional properties of protein isolated from the seeds of Lonchocarpus sericeus (LS) and Delonix regia (DR) were investigated. The proteins were isolated by alkaline solubilisation, and acid precipitated at pH 10.5 and 4.5, respectively and then freeze-dried. The functional properties evaluated include water absorption capacity that was 226.6 and 190.0 ml/g, respectively for D. regia and L. sericeus while the oil absorption capacity was 215 and 166.83 ml/g for the protein isolates (D. regia and L. sericeus). The two isolates exhibited similar bulk and tap density values of 0.5 and 0.51 g/cm3, respectively. The foaming capacity and stability for the isolates were 7.33 and 6.66% and 2.67 and 2.33% for D. regia and L. sericeus in that order. Swelling power was 2.34-7.47% and 2.71-3.59%, and solubility ranged from 12.75-35.5 and 34.00-100% respectively for D. regia and L. sericeus at a temperature of between 55 and 95°C. pH from the acidic to the alkaline region affected the swelling power of the isolates similarly, but a reversed effect on the solubility. The emulsion capacity and stability obtained were 34.14 and 30.77% and 30.4 and 29.69% for D. regia and L. sericeus. There was a significant difference between swelling power and solubility, the effect of pH on swelling power and solubility and water and oil absorption capacity. However, there was no significant difference between bulk and tap density, foaming capacity and stability, and emulsion capacity and stability. Both isolates were found to possess functional properties that were similar and in some instances, better than the protein isolates of some popular legumes.

KEYWORDS: Functional properties, protein isolates, Lonchocarpus sericeus, Delonix regia

INTRODUCTION

The functional properties of a protein are responsible for many of the factors that affect consumer acceptance of food products; therefore, they play a crucial role in food processing as well as in the development of food products (Boye, et al., 2010). The use of plant protein in the formulation of a new product or conventional food has been the focus of most researches in recent years. Legumes are used to minimise the problem of protein malnutrition in Africa (Lawal et al., 2005) because animal protein is beyond the reach of a large percentage of the people in developing countries. Seed protein provides essential amino acid, but they should also possess requisite functional properties for their successful utilisation in various formulations. Legumes are the edible fruits or seeds of plants that provide protein when consumed. They belong to the family of Leguminosae and are widely cultivated throughout the world (Ayodele & Ade-Omowaye, 2015). Vegetable proteins have been widely used in various food applications, due to their satisfactory functional properties, such as emulsification, fat and water absorption, bulk density, gelation and solubility.

The inadequate supplies and shortage of food protein have made the search for unconventional legumes as a new protein source for use in both functional food ingredient and nutrition supplement (Shahidi et al., 2001) necessary. To develop an alternative plant protein source for use as an ingredient or supplement, the functional properties of the plant source must be evaluated (Aluko & Adebiyi, 2011).

Lonchocarpus sericeus is a leguminous plant commonly called cube root or Senegal lilac (Oyedeji et al., 2015). It grows from 10 to 16 m high and has a purple flower, which makes it perfect for display purposes; and frequently planted in villages as a shade tree in the gardens. Delonix regia is a species of flowering plant in the bean family Fabaceae. D. regia is noted for its fern-like leaves and colourful display of flowers. It is commonly known as the flame of the forest. It is called Royal poinciana or flamboyant. The pods usually green, and flaccid when young and turn dark-brown and woody at full maturity, and can be up to 60 m long and 5 m wide. The seeds usually small, and on the average weighs 0.4 g (Sujak et al., 2006). In areas with a marked dry season, it sheds its leaves during the drought, but in other areas, it is virtually evergreen. L. sericeus and D. regia are
examples of leguminous plants that could serve as an alternative source of protein; this, therefore, seeks to evaluate the functional properties of protein isolates from the seeds for their practical applications.

**Materials and method**

**Sample collection and protein isolation**

The seeds of *L. sericeus* and *D. regia* obtained at the East campus, Federal Polytechnic Ilaro, Ogun state by picking were cleaned of extraneous materials, washed with distilled water and air-dried. The cleaned seeds were milled into flour using grinding machine and stored in an airtight container at 4°C until required.

Protein was isolated and purified from the seeds flours following the procedure of Shahidi et al. (2001). Briefly, 1 kg of the milled sample (flour) soaked in 4 L of distilled water and the pH adjusted to 8.0 - 9.0 with 0.2% NaOH solution was constantly stirred at room temperature for 4 hours. The resulting suspension was centrifuged at 4600 rpm for 15 minutes, and the supernatant adjusted to pH 4.5 with 1 M HCl followed by centrifugation at 4600 rpm for 15 minutes. The residue obtained (protein) was washed free of acid with distilled water, and then freeze-dried and kept in an airtight glass container.

**Evaluation of functional properties**

**Bulk density**

Bulk density was determined using the method Ogunwolu et al. (2009). 50 g of sample was weighed into 250 ml graduated measuring cylinder. The sample was packed gently by tapping the cylinder 100 times until there was no decrease. The volume was recorded and the bulk density expressed in g/cm³.

**Swelling power and solubility**

Determination of the effect of temperature on swelling power and solubility was carried out in the temperature range of 55 – 95°C, using the method of Neto et al. (2001). 0.2 g of protein isolate sample was carefully weighed and quantitatively transferred into a clear dried test tube and weighed (W1). 20 ml of distilled water was added to the test tube, and the mixture was mixed vigorously for 30 s. The resulting slurry was heated at desired temperatures, varied between 55 and 95°C for 30 minutes (using a temperature-regulated water bath). The mixture was cooled to room temperature and centrifuged (5000 g, 15 min). The residue after centrifugation with the water is retained, and the test tube was weighed (W2).

\[
\text{Swelling of starch} = \frac{W_2 - W_1}{\text{Weight of starch}} \times W_2
\]

Aliquot (10 ml) of the supernatant obtained after centrifugation was dried to a constant weight at 110°C. The residue obtained after drying the supernatant represented the amount of protein solubilized in water. Solubility was calculated as g/100 g of protein on dry weight basis.

**Effects of pH on swelling power and solubility**

Effects of pH on swelling power and solubility were investigated with the procedure of Sathe and Salunke (1998). 0.2 g of the sample weighed into a test tube with 10 ml of water was shaken for 30 sec. The pH was adjusted to the desired value (2 - 12) with either 0.1 M HCl or 0.1 M NaOH. The resulting slurry was transferred into a measuring cylinder, with little water added to make a total volume of 20 ml. The slurry was allowed to stand for one hour at room temperature, and thereafter centrifuged at 5000 g for 15 minutes. 10 ml of the supernatant was pipetted for solubility determination, the remaining supernatant discarded. The centrifuge tube with the sample in it was re-weighed. The pipetted supernatant in a weighed beaker was dried in the oven at 110°C, and the beaker with the residue after drying was weighed to determine the percentage solubility of the starch.

**Oil and water absorption capacity**

The method of Beuchat, (1977) was used to determine oil and water absorption capacity of the protein isolates. 10 ml of distilled water or oil (power oil) was added to the 1 g of the sample. The mixture was mixed vigorously for 30 s and allowed to stand for 30 min. The volume of the supernatant was recorded. The mass of oil and water absorbed was expressed as g/100g protein on a dry weight basis.

**Foaming capacity and stability**

The foaming capacity and stability of the protein isolates were determined according as described by Neto et al. (2001). A 3% (w/v) mixture of protein isolate was prepared in distilled water. 50 ml portion of the mixture was immediately transferred into a graduated cylinder and the volume noted. The mixture was whipped in a blender at high speed for 4 min and the volume after whipping was recorded. Foaming capacity was expressed as
percentage volume change induced by whipping. The percent change in volume of foam after 60 min of standing at room temperature was recorded as foam stability.

\[
\% \text{ Volume change} = \left( \frac{V_2 - V_1}{V_1} \right) \times 100
\]

Results and discussion
Bulk capacity and tap density
The results of bulk capacity and tapped density for the protein isolates are as shown in Fig. 1. The bulk density of *D. regia* (0.5 g/cm\(^3\)) is found to be lower than that of *L. sericeus* (0.53 g/cm\(^3\)). There was no significant difference with respect to tap density in both samples, however, significant difference existed between the samples in terms of bulk capacity. The bulk capacities obtained for the isolates in this study are comparable to that of cowpea protein isolate as reported by Suleiman et al., (2006). Bulk capacity depends on the mutual effect of related factors that includes the intensity of attractive force and particle sizes.

Swelling power and solubility
The swelling power and solubility of protein isolates is temperature dependent ranging from 55 to 95°C. The solubility of both samples increased similarly from 75 to 95% when temperature was increased from 55 to 95°C. The minimum solubility of *L. sericeus* and *D. regia* were 34 and 12.75%, respectively at 55°C. There is significant different between the swelling and solubility of the two protein isolates.
Effect of pH on swelling power and solubility

Effect of pH on swelling power and solubility are as shown in Fig. 3 and 4. The swelling power of D. regia protein increased with an increase in pH while that of L. sericeus decreased in like manner. The minimum swelling power for the isolates was exhibited at pH 2 and 10 for D. regia and L. sericeus, respectively. The maximum solubility of the protein isolates occurred at pH 10 and 2 for D. regia and L. sericeus, respectively. The effects of pH on swelling power and solubility was significantly different in the two protein isolates. The results of this study are similar to those obtained from green pea as reported by Prakash and Narasinga, (1998).

![Figure 3: Effect of pH on swelling power of protein isolate from D.R and L.S. Error bar; standard deviation. Result are means triplicate determinations. D.R: Delonix regia L.S: Lonchocarpus sericeus.](image)

![Figure 4: Effect of pH on solubility of protein isolates from D.R and L.S. Error bar; standard deviation. Result are means triplicate determinations. D.R: Delonix regia, L.S: Lonchocarpus sericeus.](image)

Water and oil absorption capacity

The result of water and oil absorption capacity for D. regia and L. sericeus is shown in Fig. 5. The water and oil absorption capacity ranged between 215 - 266.67 and 166 - 190 ml/g for D. regia and L. sericeus, respectively thus showing D. regia as having higher water and oil absorption capacity. Water absorption of proteins affects the swell ability, dissociation and unfolding to reveal additional binding sites. Water absorption of protein is predicated on the polarity amino acids make-up of the protein (Kuntz, 1971). Oil absorption capacity of L. sericeus was found to be higher than that of D. regia and they were different from one another. Oil absorption capacity is of pronounced significance from an industrial standpoint, as it reveals the emulsifying capacity of the protein, a highly desirable characteristic in products such as mayonnaise (Silva et al., 2003).
Foaming capacity and stability

Foaming capacity and stability for the protein isolates of D. regia and L. sericeus is as shown in Fig. 6. D. regia had greater foaming capacity and stability compared with L. sericeus. Foam formation is determined by three factors that include transportation, infiltration and re-organization of the molecules of the air-water interface. Therefore, to demonstrate good foaming capacity, a protein must be capable of migrating through the air–water interface, unfolding and rearranging at the interfaces (Ogunwolu et al., 2009). The foam capacity and stability of proteins are enhanced by greater protein concentration because this increases the viscosity and enables the formation of a multilayer cohesive protein film at the interface (Damodaran, 1997).

CONCLUSION

The functional properties of protein isolated from the seeds of D. regia and L. sericeus were investigated and both samples were found to possess higher values of foaming capacity and stability, bulk and tapped density, water and oil absorption capacity, swelling power, emulsion properties and gelation properties. The solubility of the two protein samples is high enough to suggest that they could be potentially useful in some food formulations.
REFERENCES


FUNCTIONAL PROPERTIES OF STARCH ISOLATES FROM THE SEEDS OF Delonix Regia (FLAME OF THE FOREST) AND Lonchocarpus Sericeus (SENEGAL LILAC)

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ABSTRACT
Functional properties are intrinsic physico-chemical attributes that affect the behaviour of properties in food systems during preparation, processing, manufacturing and storage. The functional properties of starches from the seeds of Delonix regia and Lonchocarpus sericeus were evaluated to determine their potential practical applications. The starches were isolated from the seeds after wet milling using the alkaline method and sedimentation. There was a significant difference between bulk and tapped density, oil and water absorption capacity, the effect of temperature on swelling power and effect of pH on solubility of the two starches. However, there was no significant difference between light transmittance, the effect of pH on swelling power and effect of temperature on solubility. The bulk and tapped density for D. regia and L. sericeus were 0.46±0.00 and 0.54±0.00 g/cm³, and 0.6±0.00 and 0.67±0.00g/cm³, respectively. Swelling power and solubility for D. regia were 5.09-2.59 g/g and 13-6.67%, respectively, and 5.35-4.67 g/g and 10.67-17.7%, respectively for L. sericeus. Oil and water absorption capacity for L. sericeus (93±0.05 and 126.67±0.12 ml/g, respectively) is lower than D. regia (144±0.18 and 333.33±0.23 ml/g, respectively). An increase in pH resulted in increased in swelling and solubility also for the two starches. Values obtained in the present study for the different parameters compared well with those reported in the literature for starches from popular legumes. The two starch isolates are therefore suggested for further studies, especially regarding the modification of their functional properties so they could be explored to meet the increasing demand for starch for domestic and industrial applications.

KEYWORDS: Functional properties, protein isolates, Lonchocarpus sericeus, Delonix regia

INTRODUCTION
Lonchocarpus sericeus (L. sericeus) is a leguminous plant commonly called cube root or Senegal lilac with pinnate leaves and purple or lilac color flowers. It is a dry deciduous tree that can grow from 2–15 and 1.2–1.4 m in height and span, respectively. It is native to the West Africa sub-region including Cameroun. Its stem bark extract has been employed as a laxative, and in the treatment of ailments including convulsion, backache and as a liniment for parasitic skin infections. It is reported to be rich in the insecticide rotenone, a violent poison and other bioactives including include quercetin, coumaric acid rutin, β-sitosterol, pterocarpans and isoflavonoids (Agbonon & Gbeassor, 2009; Abdullahi et al., 2013; Iwu, 2014; Oyedeji et al., 2015). Delonix regia, an underexploited legume, belonging to the family of fabaceae (legumes) with its golden-yellow flowers is widely cultivated and may be seen in estates and parks in tropical cities all over the world. It stands hard pruning and can be kept at a small size, and even grown in the conservatory (Nawrocki, 2004). All the parts of D. regia grown have not been exploited as foods or feeds. However, Agunsoye et al., (2019) had employed D. regia seeds as reinforcement for the production of polymeric composites and found it to be suitable in engineering applications. Oyedeji et al, (2019) also examined the seeds of D. regia for its nutritional benefits and concluded that it is rich in minerals including sodium, iron and zinc. The seed was also reported to be abundant in amino acids such as glutamic acid and methionine, and its oil very rich in linoleic and palmitic acids.

Legumes contain about 60% carbohydrates including starch, reducing and non-reducing sugars, and oligosaccharides belonging to the raffinose family. Legumes are an excellent source of carbohydrates and starch constitutes the main portion of legume carbohydrates (Sathe & Salunkhe, 1981), and contributes significantly to the textural attributes of numerous foods and has many industrial uses (Sirivongpaisal, 2008). The growing starch necessities alongside its increasing industrial usage call for the use of starch from underutilised legumes such as L. sericeus and D. regia.

This study, therefore, seeks to evaluate the functional properties of starch isolates from the two underutilised leguminous seeds for practical applications due to a growing demand for new starch sources.
Materials and method

Sample collection

*Delonix regia* and *L. sericeus* seeds were collected from the premises of Federal Polytechnic, Ilaro East Campus, Ilaro, Ogun State where they are planted as shaded tree in the compound. All other chemicals are analytical reagent grade.

2.2 Isolation of starch

Isolation of starch was carried out by the method of Lawal and Adebowale, (2005). The sample was milled and the milled sample (flour) was soaked in distilled water and the pH was adjusted between the range of 8.0 – 9.0 using NaOH solution (0.2 %) at room temperature for four hours with continuous stirring. The suspension obtained was screened using muslin cloth and was centrifuged for thirty (30) minutes at 4600 rpm. The starch obtained was washed twice before drying in the air for 48 hours at 30°C.

2.3 Methods

2.4 Bulk and tapped density

This was determined by the method of Wang and Kinsella (1976). 250 ml capacity graduated cylinder was filled with 50 g of the starch sample. This was done by gently tapping the bottom of the cylinder on the laboratory bench several times until there is no further decrease of the sample level after filling to the graduated cylinder. Result was expressed as g/cm$^3$.

2.5 Swelling power and solubility

Determination of the effect of temperature on swelling power and solubility was carried out in the temperature range of 55 – 95°C, using the method of Leach et al., (1959). 0.2 g of starch samples was accurately weighed and was quantitatively transferred into a clear dried test tube and the weight noted as ($W_1$). 20 ml of distilled water was added to the test tube and the mixture was mixed thoroughly on a horizontal mixer for 30 s. The resulting slurries were heated at desired temperatures, varied between 55 and 95°C for 30 minutes (using a temperature regulated water bath). The mixture was cooled to room temperature and centrifuged (5000 rpm, 15 min). The residue after centrifugation with the water it retained and the test tube was weighed ($W_3$).

\[
\text{Swelling power} = \frac{W_3 - W_1}{\text{Weight of starch } W_2}
\]

Aliquot (10 ml) of the supernatant obtained after centrifugation was dried to a constant weight at 110°C. The residue obtained after drying the supernatant represented the amount of starch solubilized in water. Solubility was calculated as g/100 g of starch on dry weight basis.

2.6 Effects of pH on swelling power and solubility

The effects of pH on swelling power and solubility was investigated using the method of Sathe and Salunke (1981). 0.2 g of the sample was weighed into a test tube, 10 ml of water was added to the portion and was shaken for 30 sec. The pH was adjusted to desired value (2 - 12) with 0.1 M HCl or 0.1 M NaOH. Then the slurry was poured into measuring cylinder and little water was added to make a total volume of 20 ml. and was allowed to stand for one hour at room temperature. centrifuged at 5000 g for 15 minutes, then 10 ml was pipette for solubility determination, the remaining supernatant was discarded. The centrifuge tube with the sample in it was weighed. The pipette supernatant in a weighed beaker was dried in the oven at 110°C. After drying, the beaker and the residue was weighed to determine the percentage solubility of the starch.

2.7 Oil and water absorption capacity

The method of Beuchat (1997) was used to determine oil and water absorption capacity of the starch. 10 ml of distilled water or oil (Power Oil) was added to 1 g of sample. The mixture was mixed thoroughly on a mixer for 30 s and allowed to stand for 30 min. then the volume of the supernatant was recorded. The mass of oil and water absorbed was expressed as g/100 g starch on a dry weight basis.

RESULTS AND DISCUSSION

The results for the bulk and tapped density for the two starches are indicated in Fig.1. The bulk and tapped density for *D. regia* are 0.46 and 0.6 g/cm$^3$, respectively and theses values are lower than the 0.54 and 0.67 g/cm$^3$, respectively for *L. sericeus* starch. However, there is a significant difference between the bulk and tapped density of *D. regia* and *L. sericeus*. Similar observations were reported on bulk density for two cowpea
Cultivars, WCS (0.58 g/cm$^3$) and BCS (0.60 g/cm$^3$). The higher the bulk density, the coarser the particles of the sample and this affects the seed shape, as seeds with the higher bulk density tend to be more round (Ashogbon & Akintayo, 2013).

Swelling power and solubility of starches were temperature dependent and the temperature range from 55 - 95°C. Fig. 2 indicates the swelling power for both D. regia (5.09 – 2.59 g/g) and L. sericeus (5.35 – 4.67 g/g) decrease with increase in temperature. This observation is at variance with the report of Ashogbon and Akintayo, (2013) that observed an increase in swelling and solubility of starches from cowpea with increase in temperature.

The solubility of D. regia (24.69 – 13.31 %) decreases and L. sericeus (23 – 12.32 %) increases with increase in temperature respectively. And also the solubility of D. regia and L. sericeus are not significantly different. Similar observations were reported for black bean starch 17.91% (Lai and Varriano-Marston, 1979) for solubility at 95°C, and improved bean starch for three varieties ranged between 17.69 to 20.42% (Shimelis et al., 2006) which increase with increase in temperature. Halah et al. (2015) observed a decrease in solubility for barley starches (8.9 %), Hizukuri et al. (1998), reported a low solubility of water chestnut starch. Water chestnut starch exhibited slightly lower water solubility than corn starch.
It was observed from this study that swelling power is pH dependent as indicated in Fig. 4. The swelling power of *D. regia* increased from 5.0 – 6.34 g/g while it decreased for *L. sericeus* from 5.74 – 3.38 g/g with pH increase. There is no significant difference between the effect of pH on swelling power for *D. regia* and *L. sericeus*. Lawal, (2004) observed an increase in swelling power for native hybrid maize starch with increase in pH. Under alkaline conditions, starches may undergo partial gelatinisation, thus resulting in higher swelling and solubility. This accounts for higher swelling and solubility of the starches at the extreme of the alkaline range (Lawal, 2004) as observed in this study.

From Fig 5, both the oil and water absorption capacity of *D. regia* (144 and 333.33 % respectively) are higher than that of *L. sericeus* (93 and 126.67 % respectively). There is significant difference between the oil and water absorption capacity. These results agree with the observations reported for the water and oil absorption capacities flours and starches from improved bean (Shimelis et al., 2006) and the starch of Great Northern Bean. The high water absorption at 21°C may have been due to the nature of the starch and a possible contribution to water absorption by the cell was material which was not removed completely (Sathe & Salunkhe, 1981). The formation of hydrogen bonds between the hydroxyl groups of different starch chains reduces their water binding capacity. Water binding by starches is a function of several parameters including shape, size, conformational characteristics, steric factors, hydrophilic-hydrophobic balance in the starch molecule, lipids and carbohydrates.
associated with the proteins, physicochemical environment, and thermodynamic properties of the system and solubility of starch molecules. (Shimelis et al., 2006).

CONCLUSIONS
Upon evaluation of the functional properties of *D. regia* and *L. sericeus* starches, the two starch samples exhibited good potential as functional ingredient that could be useful as starch supplements and ingredient in human diet upon further evaluation of their composition and anti nutrient constituents. The starches can also be used in the food processing industry and non-food applications of starch such as in paper and textile industries.

5.0 REFERENCES


LOW LEVEL OF PARTICIPATION OF WOMEN IN ENGINEERING
AND TECHNOLOGY: CAUSES AND SOLUTIONS

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ABSTRACT

The engineering profession has always from the time past seen as a ‘man’s profession’. This can be because of the much physical activities required in the early engineering days when machines were in minimal use, as a result, women seen as the ‘weaker vessel’ do not want to venture into the field even though most of them have the intellectual capacity to excel in the field. The move by most countries over the centuries from Energy-based economy to Knowledge-based economy has resulted in the clamor for gender equality in the workforce of a nation. This paper tends to critically look at the causes of low level of participation of women in Engineering and Technology and also the solutions to address these causes. Literatures were reviewed and results shows that Gender stereotype, few women role model and self-doubt are the main opposition to women participation in engineering. Findings were tabulated for easy comprehension. At the end suggestions were made regarding the solutions to solve this problem.

Key words: Energy-based Economy, Knowledge-based Economy, Engineering, Technology.

1. INTRODUCTION

There has been increased clamor for an improvement in the number of women in Science Technology Engineering and Mathematics (STEM). The step taken has resulted in the increase of women in STEM but even with the increase, gender disparity is still more pronounced in the STEM fields particularly in the Technology and Engineering fields (Okorafor, Kakiri and Okorafor, 2015; Susan, 2016). Over the years, the ratio of boys to girls admitted in Engineering and technology in Federal polytechnic Ilaro (FPI), Ogun State Nigeria has been low. This problem is not peculiar to FPI alone but cuts across the institution of higher learning in Nigeria, Africa and the World at large. It is noted that 15.1% of engineering undergraduates in the UK in 2017 are women (Sarah, 2018). This low Enrollment of women in tertiary institutions also reflects in the workforce, hence the “Leaky Pipeline” Metaphor: Consequently, a leak at one stage of the pipeline logically accounts for the shortage in later stages (Badrul and Rohani, 2015). A 2017 survey shows that 11% of the engineering workforce is female (Sarah, 2018).

Engineering mainly seen as a man’s occupation has been experiencing over the years mass exodus of females who have an engineering degree to other non-engineering related field. Fewer females are likely to enter a career in technology, engineering and physical sciences while more are likely to exit those career environments (Rebecca, Aruquia, Itoro, and Maria, 2018). It has been reported that an estimated 40% of women leave the engineering practice (Rebecca, 2014). Also engineering related subjects like Computer Programming which was initially occupied majorly by females has been over taken by men. As (Uyino men and Chiemeke, 2015) rightly puts it “though women were the programmers of ENIAC, America’s first electronic computer, today they are dramatically under-represented in Information Technology fields”.

Most of the world has moved from an economy that is energy-based to knowledge base, it is therefore desirable to obtain a better gender balance within Engineering discipline especially in developing countries like Nigeria as Science Technology Engineering and Mathematics (STEM) Education can be seen as the determining factors of a country’s intellectual ability and strength which catalysis improvement in scientific research and industrialization for effective and robust economy (Roseline and Azuka, 2016). Establishments are more likely to improve performance by 15% if the organizations are more gender balanced (Rebecca et al, 2018). The underrepresentation of women in hard sciences such as Engineering and computer technology will create a
narrow-focused industry and as Dr. Omobola said in an article published by (Titilola, 2018) that “a narrow-focused industry will not address the issues of humanity as it should”. A country that neglects the provision of good quality science education will find itself to be a dumping ground of other people’s innovations (Roseline & Azuka, 2016).

The wide gap in Engineering is as a result of Economic, Political and socio-cultural factors (Carolina and Bábara, 2018). Women because of childbirth and family engagements has resulted in them partially/ (or not) practicing engineering (Uyinomen and Chiemeke, 2015; Liza and Sarah, 2014). Considering the under-representation of women in Engineering, it is disappointing not to see more attention given in the literature to explore the reasons for this gender imbalance (Liza and Sarah, 2014). Steps on how to attract, encourage and keep the females in Engineering is crucial if we want to obtain a better gender balance to address the ‘leaky pipeline’ within the Engineering discipline. In the light of this, this quote “I do belong here [in engineering]. I will graduate as a woman engineer and when I go out into the world I will kick ass . . . But the difference between women and men in engineering is that while men are all for themselves, we women know that what we do today directly impacts the women engineers of tomorrow, and so I’m not just one woman—I am all women” gotten from a student (Tylor) in study by (Carroll, Susan, Erin, and Brian, 2018.) should serve as a motivating factor for women to engage and stay put in Engineering.

2. LITERATURE REVIEW

Despite the achievement of women like Funke Opeke, Dr. Omobola Johnson, and so many others more in STEM related careers, which is supposed to be a motivating factor. Women are still underrepresented in this field. The causes identified were: poor visibility in sciences and technology based subjects, family engagements, Educational stakeholders having a negative perception that science and technology is more important to boys than to girls, and poor self motivation. They opined that more women can be attracted to the field of science and technology through the use of ICT especially through blogs (Raimi, Shokunbi, and Peluola, 2015).

(Carolina and Bábara, 2018) stated that women constitute 28.8% of the worldwide science researchers. They identified low participation of women in engineering discipline. Social stereotype, academic career distinction, job positions and salary gap as the factors causing this low participation. To tackle this issue, they postulated that parents, schools play a vital role in addressing it.

(Liza and Sarah, 2014) identified low level of women in top levels of Academic institution. The absence of women at the top tier results in negative influence to the women aspiring for a name in STEM and discrimination of women during recruitment process.

Females exploitation by male lecturers in SMT education, Professional gender labeling, Peer group influence, Family background are the barriers identified by (Iwu and Azoro, 2017) in their study to ascertain the barriers causing low participation of women in science, mathematics and technology. The solutions gotten to tackle the problems were as follows: Using successful females of SMT education as resource persons during career day in schools will increase participation of females in SMT, Scholarships to females in SMT education will increase participation of females in SMT, A pragmatic approach such as the use of 21st century teaching strategies in the teaching of SMT in schools will increase participation of females in SMT.

3. STAGES TO ENCOURAGE MORE PARTICIPATION OF WOMEN IN ENGINEERING

From the reviews, to kindle the light of Engineering and technology in females should start from childhood down to till the workplace. This is shown below at the following places:

Home

Breaking down social stereotypes: there should not be a ‘boy toy’ or ‘girl toy’. The ‘boy toys’ like computer game, trucks, robots and so on has a way of kindling interest in science and engineering. Female kids should be allowed to play with toys that can stimulate engineering curiosity in them. Parents should also promote girl’s scientific curiosity by engaging them in extracurricular activities involving STEM topics.
Primary school

Introduction of STEM subjects early in a student’s life, frequent sensitization of parents and teachers of primary school students emphasizing capability in the choice of career to address gender bias (Roseline & Azuka, 2016). Getting girls comfortable in STEM subjects at tender ages will inform their decisions to either pursue careers in tech or build tech enabled businesses (Titilola, 2018). It was observed that tutors normally have much interest in teaching STEM subjects like mathematics, Physics, Chemistry to boys than to girls in believe that those courses are meant for boys. This should not be the case as research has shown that girls do perform well, sometimes more than the males in STEM subjects.

Secondary school

Secondary school is the foundation for the choice of careers for students, yet, there is little research on gender valuation of science and technology among secondary school students in Nigeria (Roseline & Azuka, 2016). According to them a training program in science related subjects at the junior secondary school level will help achieve gender equality in science and technology.

Tertiary institutions

It is observed that most female Engineers look for another career unrelated to Engineering after graduation. Therefore more female tutors should be employed in the tertiary institutions to serve as a direct guide and motivators to female students. This will ensure they will continue in their career path after they have graduated.

Work place

Women at all levels especially at the top tier should be visible. This will serve as a motivation to younger girls who will like a career in Engineering. Also more women at top tier will ensure lower gender discrimination against women during recruitment process.

It is shows that women are disliked when they are successful in jobs that, based on gender stereotypes, are just for men. For this situation, the author encourages women to continue doing work with high levels of competence independently of the negative social responses.

General

More initiatives by countries and organization to Encourage women in Engineering should be implemented. These initiatives like establishment of February 11th as The International Day of Women and Girls in Science by the resolution A/RES/70/212 from the United Nations, Women in Technical Education and Employment (WITED) in Nigeria, should try to increase the visibility of successful scientific women that would, by this increased visibility, become role models to stimulate girls to follow scientific and Engineering careers and to reach leadership roles.

Initiatives like the Athena Swan Charter launched in 2005 which recognizes the commitment made by higher education institutions to advancing and promoting women’s careers in science, technology, engineering, mathematics and medicine (STEMM) in the UK (Liza and Sarah, 2014). This initiative has encouraged more women in STEM education. An initiative tailored specifically for Women’s participation Engineering and technology will close to a reasonable extent the gender gap being experienced in Engineering profession worldwide.
Table 3.1: Barriers and solution to women participation in Engineering and Technology.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Solution</th>
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<tbody>
<tr>
<td>Lack of sponsorship</td>
<td>Availing Special Scholarships for only females studying Engineering at any educational level.</td>
</tr>
<tr>
<td>Few female role models</td>
<td>Women should be more visible and always turnout in Engineering and technology gatherings. They should also aim to attain top positions in organizational management to curtail unconscious bias during recruitment process.</td>
</tr>
<tr>
<td>(invisibility)</td>
<td></td>
</tr>
<tr>
<td>Few Female teachers in Engineering</td>
<td>Employ more female Engineering Educators in the Tertiary institution whom will also act as counselors to the female undergraduates.</td>
</tr>
<tr>
<td>Gender Stereotype</td>
<td>No ‘boy toy’ or ‘girl toy’ at home. Every child should be allowed to play with whatever it wants. The idea that men performs better than women in engineering is false, research has made it known. Making this knowledge known will address the salary gap and decrease conscious and unconscious bias.</td>
</tr>
<tr>
<td>Insufficient initiatives</td>
<td>Introducing more programs like the WITTED by government, organizations.</td>
</tr>
</tbody>
</table>

4. CONCLUSION

Engineering and Technology involve many STEM subjects that are essential in developing our mind for critical thinking and problem solving ability. The low level of participation of women in Engineering and technology especially in developing nations is tantamount to a one-legged man walking towards technological advancement, which will make development slow. Having more women in Engineering means having more workforce and required skill sets needed in engineering discipline for rapid national development. Therefore steps have to be taken to make Engineering appealing to women. These steps should start immediately from childhood (home) down to tertiary level, and after they have gotten the degree encourage them not to divert to other discipline but to practice engineering effectively.

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ACHIEVING SUSTAINABLE DEVELOPMENT AND GOOD GOVERNANCE IN NIGERIA: THE ROLE OF WOMEN IN TECHNICAL EDUCATION

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ABSTRACT

The paper examines the roles of women in technical education (WITED) towards achieving sustainable development and good governance in a developing nation like Nigeria. The paper identifies factors hindering the involvement of women in technical education towards the drive for sustainable development and good governance in Nigeria. Women are faced with issues of gender inequality both in the society and places of work. The aims of this paper is to identify critical areas of women's contribution, challenges, limitation and proffering solution so as to enhance sustainable development of the nation through an active involvement of women. The paper is qualitative in nature and relies on secondary sources for data collection and the discussion that followed. It is in line with the foregoing, that this paper concludes that women should be supported and encouraged for active participation in developmental processes. The study recommends that women should be empowered in processes of development in a developing society like Nigeria in order to have a sustainable development and good governance.

Keywords: Women, Sustainable Development, WITED, Good Governance

1. INTRODUCTION

The role women play is very vital in enhancing the dynamics of a growing society. The argument about the relevance of women to their immediate environment has been settled long ago. The settlement of this argument would have led to the declaration of the 1975 and 1985 decades as the decades for women. In line with this declaration, was an adoption of the Convention for the Elimination of all forms of Discrimination against Women (CEDAW) initiated by the United Nation (UN) (Ode, 2013). Nigeria was a party to this convention. Ever since the signing of this pact, Nigeria as a country has made little or no efforts to domesticate the provisions of the convention through any form of legislation either at the federal or state levels of government. Although feeble efforts have been made to mainstream the feminine gender especially with particular reference to governance. The involvement of women in areas such as education, health, technology etc., is crucial for the achievement of sustainable development in Nigeria. The uniqueness of this involvement is that it creates a participatory sense among women. Women feel involved in decision making processes when they are allowed to participate in deciding issues that has to do with the general public (George, Fagbohun, Olonade & Aderoju, 2018). Women make up half of the world’s population and despite their achievement of equal citizenship status to men; they remain vastly under-represented in governance. In most nations of the world, there is a clear absence of women involvement in decision-making processes at the regional, local and national levels. Gender gap in governance can be found in countries of the world not just Nigeria regardless of their economic status, religion or institutions. Factors contributing to the lack of women participation in decision-making process include their low labour force participation and time poverty in relation to men as well as stereotypical attitudes towards the societal roles of women and men. In parliamentary decision-making, women are outnumbered by men in all nations (OECD, 2008). In Nigeria, it is morally believed that men are at the helm of controlling the economy because they have better managerial skills (World Bank, 2001). Nevertheless, in 2015, governments unanimously endorsed the 2030 Sustainable Development Agenda: the fifth Goal emphasized on ensuring gender equality and women’s empowerment thus, the role of gender equality and inclusive administration and institutions in achieving more peaceful, prosperous, equal and sustainable societies is paramount. The aims of this paper is to identify critical areas of women's contribution, challenges, and proffering remedial solutions so as to enhance sustainable development of the nation through an active involvement of women. After the introduction, the paper reviews relevant literature on sustainable development and good governance which
presents the concept of women, sustainable development and the concept of good governance and thereafter, it takes a look at the challenges that hinder the involvement of women in decision-making processes in Nigeria. The last section makes recommendations and concludes this study.

2. CLARIFICATION OF CONCEPTS

The main concepts to be clarified in the context of this paper are the concept of women, sustainable development and good governance and the development of Nigeria.

2.1 Concept of Women

In line with the current debate on the girl child marriage bill in the Nigerian national assembly on who is exactly a woman, it would be difficult to give a concise definition. This is because the girl child marriage proponents declared that any girl who is married automatically becomes a woman. A woman can be defined as human species that belongs to the female class and has attained the age of puberty (Webster’s Online Dictionary, 2013). Similarly, Wikipedia (2013) noted that the term ‘woman’ is reserved for adult females while a young female is a girl. A woman can simply then be referred to as any female who is matured enough to handle matters that pertain to livelihood. For a person to be referred to as a woman, she needs to be a female who can handle the challenges of life and take appropriate decisions (Eseyin; Okafor & Uchendu, 2014). She may or may not however be married since a female who is advanced in age would not be addressed as a girl but also a woman.

2.2 Concept of Sustainable Development

The concept of sustainable development was first popularized by the United Nation’s World Commission on Environment and Development in the year 1987 (Cuillerier, 1997 in Okoye, 2018). The publication of this commission titled “Our Common Future” has made sustainable development become of upmost importance. To the commission, sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). The concept of sustainable development is subjected to different definitions according to scholars and purpose of use. Sustainable development to some requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life. Sustainable development calls for concerted efforts towards building an inclusive, sustainable and resilient future for people and planet. In order to achieve a genuine sustainable development, it involves three areas of interest; economic growth, social inclusion and environmental protection (Unachukwu & Ijeoma, 2017).

Sustainable development refers to a system of operations to delivers on goals and objectives and that guarantees consistent level and increasing level continuously. Sustainable development is defined as a process that is continuous in impacting positive improvement, growth and social change for the well-being of everyone today and creating a fair level playing ground by making life better for the future generation. In simple terms it means as you eat today make sure you don’t eat everything today but reserve for the future so that those yet unborn will have something to leverage on tomorrow. Sustainable development means that present developmental needs are met without jeopardizing future needs of other generations.

Adebayo (2012) sees sustainable development as the effort at improving the environment or natural resources for the purpose of improving the quality of human life in such a way that the needs of future generations are not jeopardized. Mohammed (2013), in his submission, sees sustainable development as the ability to preserve the existing resources of the state for the collective use of the citizens while conscious efforts are made to conserve the resources for the use of future generations. The role of women in ensuring sustainable development in the country cannot be over emphasized. Development in a country is a product of the effort of the productive members of the country. As such, women in the society have important roles to play in sustaining the development of the nation. This role can be effectively achieved when women are given equal opportunity to contribute to the standard of the economy like their male counterpart. Contrary to this, the level of sustainable development that will be recorded in the country will remain far below the optimum capacity of the entire sectors of the nation.

2.3 Concept of Good Governance

Good governance as a question, has gained the interest of international institutions, like the World Bank and few between legislative associations such as the Great Countries of the world. These two Institutions have made the
issue of good governance a major necessity in terms of donations, aids and gift strategies to nations that are challenged on the issue of good government.

So as to make this study more significant, theoretical elucidation on administration will be made and the significance of the idea to the entire study will be plainly identified. McGinnis (1999) in his work defines governance as a platform which society, as an entity manages the large group of its political and socio-economic concern.

Oyovbaire (2007) in his definition strengthens by declaring thus; good governance involves the use of authority and power in such a way that it affects the human condition. It empowers societies to keep up, manage and enhance the personal satisfaction including the change of the physical environment. The idea “society” emerges obviously in McGinnis and Oyovbaire on administration. Kaufmann (2006) opines that administration epitomize the custom and establishment by which power in a nation is practiced to the benefit of everyone. According to him, a good administrative framework is defined by its relationship to some key prerequisites, including Accountability, Transparency, Participation, and Predictability. These key prerequisites cannot exist without an educated, politically important, well informed and ready to solve problems for group of people. A situation whereby the group of people are not well prepared against their involvement in these under listed categories. There is no doubt; basic skills of good governance will readily be damaged by the government in power. These stresses further the view that a society gets its deserved government. Furthermore, in the writings of Kaufmann (2006) recognized some basic measurement of administration; these have been classified into the above classifications. The few basic measurement of administration according to Kaufmann (2006) are:

Voice and Accountability: This applies to the length citizens of particular nation are allowed to actively participate in choosing those who govern them, so also flexibility of expression and opportunity of affiliation.

Political Stability and Absence of Violence: This explains to what chances government gets frustrated and might be forcefully removed unconstitutionally or through other violent means which includes political violence and other criminal vices.

Effectiveness of Government: involves top notch deliveries of government services which determine the length of its non-interference by public office holders. The government’s effectiveness is judged by the qualities of its policy formation and execution including the presumption of the steadfastness of administration to those formulated policies.

Regulatory Quality: Is Government’s capability of making and administering good regulations and rules which allows, elevate and reinforce growth in the private sector.

Rule of Law (RL), is to what length the citizens and political office holders have trusted and obeyed laws that exists in a society and in such a way that the qualities of agreement requirement in the officers of the law.

Control of Corruption (CC), clarifies to what extent public power are open and used for selfish interest, which are little and grand forms of corruption. It also explains how the state is being captured by the elites and private interests.

3. METHOD OF THE STUDY

This paper adopts a qualitative research approach. To achieve the objective of this study, data were sourced from secondary materials including relevant books, journals and internet resources.

Theoretical Framework

The theoretical framework for this study is Feminist theory. Feminist agreed that there are deep rooted social, economic and political inequalities between the sexes, which need to be change but they fundamentally digress in their analysis of why this situation has come about and how far it could, and should be altered through government policies. The socialist feminist traditions stretch in a complex and evolving tradition from classic work by Karl Marx. Frederick Englis, August Bebel and Alexandra Kollotaito in more recent to their theories such as Sheila Rowbothan and Juliet Mitchell. Equality of opportunity which is primary demand of classical feminist while useful is only one stage of change. The Feminist theory also focus on analyzing gender inequality and the promotion of women’s interest and advocate gender equality for women campaign for women’s right and interest although the terms “Feminism” and “Feminist” did not gain widespread use until the 1970s they
were already being used in the public parlance much earlier. Feminist and scholars have divided the movement’s history into three; the first-wave, the second waves and the third waves.

The first wave refers mainly to women’s suffrage movement of the nineteenth and early twentieth century (mainly concerned with women right to vote) however at the end of the nineteen century, the activist focused primarily on gaining political power, particular the right of women suffrage. The word coined respectively when the second wave feminist began to be used to describe a newer feminist movement that focused as much on fighting social and cultural inequalities as well as political inequality.

Second wave feminist refers to the period of activity in the early 1960s and lasting through the 1980s. The feminist saw women’s cultural and political inequalities as extricable linked and personal lives as deeply publicized and as reflecting sexist power structure. The Feminist mystique (1963) criticized the idea that women could only find fulfillment through childbearing and homemaking. In Friedans hypothesis that Women are victims of false belief system that requires them to find identity and meaning in their lives through their husband and children. Such a system causes women to completely lose their identity in that of their family. Friedans specifically locate this system among post- World War II middle class suburban communities.

The third wave began in the early 1990s, arising as a response to the perceived failures of the second wave and also a response to the backlash against initiatives and movement created by the second wave. It seeks to challenge or avoid what deems the essentialist definition of Femininity, which (according to them) over emphasize the experience of upper middle class white women. The third wave Feminists often focus on “Micro-Politics” and challenge the second wave’s paradigm to what it is good and not good for Female. The third wave also contained internal debates between different Feminist such as psychologist Carol Gilligan (who believed that there are important differences between the sexes) and those who believed that there are no inherent differences between the sexes and contend that gender role are due to social conditioning.

4. SUSTAINABLE DEVELOPMENT AND GOOD GOVERNANCE IN NIGERIA: THE ROLE OF WOMEN IN TECHNICAL EDUCATION (WITED)

Technical and vocational trainings are both ways women can be empowered for good governance and sustainable development. These trainings helps women acquire the power to think and act freely as they want thereby fulfilling their potentials to be equal members of the society. Women empowerment involves the adequate provision of abilities, skills and competences of mental and physical nature inclusive thereby enhancing their productivity in the society. Acholonu (2006), in his work empathized that the acquisition of necessary skills by women is essential for their appreciation and will also change the traditional status quo that subjugates and marginalizes them in the society. However, empowering women helps to bring them into the main stream of the development process. Adetope (2004), expressed that emphasis should be place on the need to empower women to gain economic independence through entrepreneurial development programmes with a view to exposing them to different areas of understanding, controlling and directing their financial affairs. In similar opinion, vocational and technical education is seen as the root of empowering women for self-productivity and reliance. However, women involvement in technical and vocational education will help in achieving sustainable development and good governance in Nigeria as women now participate in technical courses as their male counterpart (Zuga, 1998). Women have various ways of contributing to the development of a nation. Women have some special qualities; a lot can be benefitted women if they are given the opportunity to be educated. Below are benefits of women education towards sustainable development are;

1. Quality Leadership: Women in technical education can ensure quality leadership in each of the area of their jurisdiction. This was in line with Shinaba (2008) that human rights violations, abuse of power, mismanagement of the nation’s resources and underdevelopment are trending issues in past decades by men who are in power. These periods have been characterized by violence and gross gender inequality. Therefore, women as managers of homes can implement their managerial skills in managing the affairs of any sector they find themselves if given the opportunity. Leadership qualities that would be provided by women will focus more on peace, equality, protection of fundamental human rights and peace (Eseyin; Okafor & Uchendu, 2014). With all these qualities, it is important that a nation can build a stable and achieve sustainable development.

2. Management of Resources: Around the world, women are known for their better management of resources than men. The good management of resources will help reduce waste and thereby create
room for an increase in the economic benefits of these resources. The education of women helps put their managerial skills into use and will add to the ways they manage the nation’s economic resources. Based on this, it is advised that women should be educated and empowered so they can harness their management skills and competences for the benefits of the nation at large.

3. **Healthy Nation Building:** Health status of the citizens is among factors that determines the lifespan of the masses. Similarly, the citizen’s lifespan is also a factor that determines the level of development of any nation. Orji (2004) emphasized that girl child education is one of the potent tools for reducing girls’ vulnerability. A healthy nation to scholars is a wealthy nation. Women in the society are usually known for their cleanliness and have the capacity of building a healthy nation. Gender is important in efforts to extend life expectancies since differences between men and women start at birth. Women live longer than men due to genetic factors but also to different behavioral, lifestyle and working patterns.

Women in technical education need to be vibrant and up standing in all areas of life if they are to contribute to the achievement of sustainable development and good governance in Nigeria. Furthermore, women should ensure they have one and loud voice in any sector they find themselves. Women should again ensure they contribute their quota to areas they can help the education of a girl child. Women shouldn’t feel that they can’t help if they aren’t lecturers or teachers, they can be of help especially in the admission processes in Institutions.

5. **CONCLUSION AND RECOMMENDATIONS**

5.1 **Conclusion**

This paper concludes that women should be supported and encouraged for active participation in developmental processes. Women’s contribution to sustainable development must be recognized. Women have a strong role in education and socializing their children, including teaching them care and responsibility with regard to the use and protection of natural resources.

5.2 **Recommendations**

The study recommends that women should be empowered in processes of development in a developing society like Nigeria in order to have a sustainable development and good governance. More should be done to increase women’s voice in environmental decision making and to enable women to seize opportunities in the “green economy”. More capacity building programmes and training tailored to the needs of women are needed. In order to build women as catalyst for sustainable development, their role in family, community and society at large has to free from socio-cultural and religious traditions that prevent women participation. There is need for change of mindset, especially of the males who dominate the scene.

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GENDER AND ENGINEERING: EVOLVING ACTION TO ENCOURAGE WOMEN IN ENGINEERING FOR SUSTAINABLE ECONOMIC GROWTH AND DEVELOPMENT.

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ABSTRACT

Lack of interest of women in studying a field of study related to science, technology, engineering and mathematics (STEM) and their inadequately representation in the engineering industries is of a significant concern to the economic growth and development of a nation. Therefore, any possible solution must be employ to combat these growing challenges. Communities and societal re-orientation, government agencies and industries constitute of women, educational sector among others are the sure ways to surmount these challenges. In this research, a descriptive statistic was used to conduct the study in Federal Polytechnic Ilaro, Ilaro, Ogun State, Nigeria. A sample of ten (10) STEM and twenty (20) non-STEM female National Diploma II (ND II) students in various programmes were selected within the polytechnic. The study was guided by two research questions and summarized data from a sample using indexes mean and standard deviation. A standard deviation value close or wide apart was used to determine the homogeneity in opinion among the respondents. The paper also intended to addresses factors affecting engagement of students in science and mathematics in school, and STEM career pathways, the lower rate of women in STEM and what factors impact their participation in STEM. Closing the gender gap in science is of critical importance for all countries because failure to do so means the loss of vast human resources that could contribute to national development and could further entrench gender inequality in society.

Keywords: STEM, gender gap, societal re-orientation, industry, economic growth.

1. INTRODUCTION

Science, Technology, Engineering, and Mathematics (STEM) are widely regarded as critical to the national economy (Fensham, 2008). There is no significant change to the record of the fewer number of women who choose to study careers related to Science, Technology, Engineering and Mathematics (STEM) to date despite the great strides made toward gender equality over the last century. Women are often underrepresented in the field of engineering or in the profession of engineering and technology, yet many have contributed to the diverse fields of engineering historically (Julian, T., Langdon, D., Beede, D., McKittrick, G., Khan, B., & Doms, M. 2011).

According to (Julian et al, 2011) women in technology study, many challenges still need to be addressed to solve this problem from persistent gender bias in the workplace to continued lack of female mentors. Three of the most common challenge that women encounter in the engineering profession include: unequal growth opportunities compared to men, lack of female role models (or mentors) in the field and gender bias in the workplace. One of the primary measures to put into consideration against diversity gap in STEM field is the cultural change (Fensham 2018). This does not mean cultural change in workplace alone, but also in a broader society. Therefore, there are things we can do to bring about this change both institutionally in our industries and in the wider community.

Addressing the problem of unconscious bias is part of the cultural change. For example majority of the software developers in many companies are men, people may subconsciously believe that men are therefore better at software development. It may not happen to them to explore candidates that do not meet the stereotype for that role. And women who see that most software engineer are men may not even consider it as a potential career path to them. There are institutional things that could be done to change this. One would try to create a policy of interviewing at least one diversity candidate for every hiring opportunity.

With more women in STEM fields, the national wage gap would likely shrink. Social status is often associated with a greater fiscal income, and professions in the STEM fields are seen as more prestigious within the labor
force. This contributes to the divide of social status between men and women because there are currently far less women with these occupations than men (Xie & Shauman, 2005). It is clear that we need more women in STEM professions, but in order to make this happen, we need to determine what factors impact their participation.

1.1 Factors Affecting Engagement Of Students in Science and Mathematics in School

Student Attitude to STEM: Lack Of Interest And Self Confidence

Interest in a particular programme is closely linked to good academic performance and Interest must be supported by ability and self-confidence to achieve a goal. Females with genuine interest in engineering have higher self confidence in their abilities to participate in engineering programmes and to have good/better academic performance. It is well known that females are more prone to low self-confidence leading to anxieties and doubt about their choices in life. Some girls and women have doubt about their ability to good academic scores in the engineering programmes, while others lack courage to venture in to engineering programmes (Adlyn, 2013). Even when discouraged, possessing self-confident can help female engineering undergraduates to excel and persevere in the programme.

Role Models in Stem: Lack of Awareness, Career Counseling and Mentoring

Role models, mentors and counsellors are like guides who can help in career advancement for women engineering. Their activity produces good attitudes or reduces negative stereotypes concerning women in engineering. Such mentor/role-model relationship can help female students on techniques to handle the “feelings of isolation and lack of support among women in STEM fields” especially engineering (Amelink, 2008). With low female engineers in academia in Nigerian universities, such guidance is insufficient (Ademari, H. O., Hassan, O. M., Siyanbola, W. O., and Taiwo, K. 2013). Due to this uneven gender ratio, it is not easy to find female mentors in STEM fields. According to (Olatundun, E., Archibong, F., Ikutebge, C., Ogunmola, E., and Alege, M. 2014), most of female respondents that performed excellently in mathematics and sciences refuse to study engineering because of lack of engineering awareness in pre-tertiary levels of education. Without pre-collegiate engineering classes or awareness, some girls do not possess the interest and/or academic qualifications to enter engineering programmes. Also, with few or no advice from role models, young girls may shy away from engineering programmes and the women who enrol in the programme tend to experience difficulties adjusting to engineering academic life therefore it may take a lot of time to find balance in academic, family and social lifestyles (Amelink, 2008).

The Science Gender Gap: Gender Stereotyping and Disparity

Gender stereotyping has lead to gender disparity in engineering and technical education. In many African countries, girls’ exclusion from science can be attributed largely to the construction of feminine identities, ideologies of domesticity and gender stereotypes (wawasi, 2008). Formal and informal socio-cultural norms and expectations about the role of females in society have tremendous effects on girls’ educational opportunities, learning outcomes and decisions about study and work. At the most basic level, obstacles to school access and retention remain fundamental barriers to girls’ participation in science, both as children and adults. Girls outnumber boys among children out of school, and they are more likely to begin schooling at a later age. In Nigeria, late school entry is a particular problem among poor children and girls. Less than 50 percent of the poorest girls are enrolled in school at age six. Girls also face greater constraints on pursuing their studies due to household demands on their labor, threats to their physical safety, lack of necessary sanitation facilities at school and societal beliefs that privilege investments in boys’ education (Maureen, 2006). Beyond access, cultural biases that impede girls’ learning and pursuit of science are significant. Gender biases and discrimination play out acutely with respect to science, particularly the physical sciences, engineering, mathematics and to some extent computer science, which continue to be seen as the domain of males (Dale, B. and Kathryn, S. 2007). Science education in particular, are often viewed as being of less value to girls, given the cultural expectations about their primary roles as wives and mothers. Parents may directly dissuade girls from pursuing science or indirectly convey their differing expectations by insisting that boys take science subjects and leaving girls to choose what they want to study. Girls themselves—as well as their families, teachers and school peers—question the relevance of science to their own lives (Hassan, 2000). People may even doubt that a woman can be trusted to fly a plane or supervise a road’s construction, which are viewed as entirely a man’s domain. Such beliefs have a negative impact on girls’ practical and academic interest and learning in science. In many countries, studies have shown that girls, on average, tend to perceive science as difficult, uninteresting or unappealing in the future prospect it offers. In addition, (Adlyn 2013), point out that female student gave opinions that the lack of interest and their poor attitude to engineering subjects can be traced to gender stereotyping.”
1.2 THE LOWER RATE OF WOMEN IN STEM AND WHAT FACTORS IMPACT THEIR PARTICIPATION

There are three main types of factor identified here for the participation of women in STEM; gender stereotyping, social and psychological barriers, perceptions of the nature of STEM work. Some of these studies explicitly refer to engineering as part of the issue relating to STEM.

Table 1. Percentage of Female University Students Enrolled in Science and Technology Courses in 12 Nigerian States, “1998–99 to 2001–2002”.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>SCIENCE</th>
<th>TECHNOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-1999</td>
<td>32.2</td>
<td>17.3</td>
</tr>
<tr>
<td>1999-2000</td>
<td>33.9</td>
<td>16.1</td>
</tr>
<tr>
<td>2000-2001</td>
<td>29.3</td>
<td>14.2</td>
</tr>
<tr>
<td>2001-2002</td>
<td>25.9</td>
<td>23.4</td>
</tr>
</tbody>
</table>


**a) Gender Stereotypes**

Women are historically stereotyped as being inadequate at math and science. Women face this stereotype throughout years of schooling in math and science classes as well as in the workplace, which impacts their participation in math and science professions. Given that men do not face a similar negative stereotype, we would not expect men to be as hindered as women, and would not be as likely to worry that they are being judged, critiqued, and evaluated by their peers based on an unwarranted negative stereotype. The pervasive stereotypes about women in society can have a negative impact on their math and science achievement, and cause them to underperform (Spencer et al 1999).

**b) Social and Psychological Barriers**

They found that in early years, without any conscious intention by parents, young girls receive less exposure to and understanding of mathematical and scientific ideas from their parents than boys. One possible reason for this practice, as reported, was parental beliefs that boys were more interested and capable in STEM subjects and that STEM subjects are more difficult and less important for girls than boys. Similarly, without conscious intention, teachers also convey gender stereotyped views regarding STEM education to the children in early years. Along with influences from parents and teachers, when girls move from childhood to adolescence, their self-perceptions and attitudes to STEM are also influenced by their peers and the media. As most media portray STEM as a male dominated domain, it is not surprising that fewer females would perceive STEM as an area of interest. Parental expectation for careers plays a vital role in shaping career aspirations. For instance, mothers’ expectations about whether their male and female children should have gender-stereotyped careers are significantly correlated with their children’s gendered career expectations. When women enter STEM majors and careers, they may be prone to ‘prevention focus’ as a result of stereotype threat (a decrease in performance that can occur when there is an expectation that women will perform at a lower level than men) in either study environment or workplace environment.

**c) Nature of Stem Work**

(Marginson et al. 2013) reported that the perceived nature, organization and career pathways of STEM fields of study and employment are a barrier for women’s participation in STEM. It appears that for women it is incredibly difficult to have a successful career, social life, and family life without compromising one or more aspects. Firstly, it is typical that women in STEM fields who want to raise a family have to make sacrifices to their career more commonly than men who have children (Ceci et al., 2009). Social norms dictate that men are the breadwinners and women are the caregivers. Even though modern family structures are redefining these roles, there is still a conservative nature and stigma surrounding women in the workforce.
2. METHODOLOGY

In this work, a descriptive research was used to conduct the study in Federal Polytechnic Ilaro, Ilaro, Ogun State, Nigeria. A sample of twenty (20) non-STEM female National Diploma II (ND II) students in various programmes were selected within the polytechnic. The study was guided by two research questions on which a structured questionnaire of 10 item five-point ordinal category (Likert scale) type is used. The 5-point Likert format comprised Totally Agree (TA) = 5, Agree (A) = 4, Neutral (N) = 3, Disagree (D) = 2 and Totally Disagreed (TD) = 1. To determine the reliability of the questionnaire, 10 copies were administered to 10 female engineering students who were not part of the sample and a reliability coefficient of 0.805 was obtained using Cronbach Alpha Coefficient method which shows that the scale used was reliable. The data collected were analyzed using statistical mean and standard deviation. The decision rule was based on real limits of numbers of 4.50-5.00 (Totally Agree), 3.50 – 4.49 (Agree), 2.50 – 3.49 (Neutral), 1.50 – 2.49 (Disagree), 0.50-1.49 (Totally Disagree) were used. Therefore, each questionnaire item having mean value greater than or equal to 3.50 was accepted, while any item that had mean value range of 2.50 to 3.49 was neutral and item with mean value less than or equal to 2.49 was rejected. Standard deviation values close or wide apart was used to determine the homogeneity in opinion among the respondents.

Research Questions
1. Factors affecting engagement of female students in STEM?
2. What factors keep motivating female students to continue in STEM despite challenges?

3. RESULT AND DISCUSSION

Table 2. Data Analysis

<table>
<thead>
<tr>
<th>Question 1. ITEM STATEMENT</th>
<th>OBSERVATION (X)</th>
<th>X-mean</th>
<th>(X-mean)^2</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical disability</td>
<td>4</td>
<td>-2.6</td>
<td>6.76</td>
<td>Rejected</td>
</tr>
<tr>
<td>Poor learning environment</td>
<td>7</td>
<td>0.4</td>
<td>0.16</td>
<td>Rejected</td>
</tr>
<tr>
<td>Discouragement from parent</td>
<td>6</td>
<td>-0.6</td>
<td>0.36</td>
<td>Rejected</td>
</tr>
<tr>
<td>Physical harrasment due to gender difference</td>
<td>10</td>
<td>3.4</td>
<td>11.56</td>
<td>Neutral</td>
</tr>
<tr>
<td>Difficulty and too much academic workload</td>
<td>11</td>
<td>4.4</td>
<td>19.36</td>
<td>Accepted</td>
</tr>
<tr>
<td>Lack of interest / background knowledge</td>
<td>11</td>
<td>4.4</td>
<td>19.36</td>
<td>Accepted</td>
</tr>
<tr>
<td>Limited lecturer to student integration</td>
<td>3</td>
<td>-3.6</td>
<td>12.96</td>
<td>Rejected</td>
</tr>
<tr>
<td>Underrated self ability and hardwork</td>
<td>11</td>
<td>4.4</td>
<td>19.36</td>
<td>Accepted</td>
</tr>
<tr>
<td>Poor practical facility</td>
<td>5</td>
<td>-1.6</td>
<td>2.56</td>
<td>Rejected</td>
</tr>
<tr>
<td>I do not like science subject</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 2. ITEM STATEMENT</th>
<th>OBSERVATION (X)</th>
<th>X-mean</th>
<th>(X-mean)^2</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self confidence</td>
<td>11</td>
<td>4.4</td>
<td>19.36</td>
<td>Accepted</td>
</tr>
<tr>
<td>Friends and family</td>
<td>3</td>
<td>-3.6</td>
<td>12.96</td>
<td>Rejected</td>
</tr>
<tr>
<td>Councellor / Mentor</td>
<td>11</td>
<td>4.4</td>
<td>19.36</td>
<td>Accepted</td>
</tr>
<tr>
<td>Job prospect</td>
<td>3</td>
<td>-3.6</td>
<td>12.96</td>
<td>Rejected</td>
</tr>
<tr>
<td>Government support</td>
<td>3</td>
<td>-3.6</td>
<td>12.96</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

Sum 99 6.6 170.04
Count (N) 15 15 15
Average (mean) 6.6
Variance (S^2) 12.14571429
Standard Deviation (s) 3.485070198

In Table 2 Question 1, shows the data analysis on factors affecting the engagement of female in engineering programs in the institution where the study was conducted. Items 5, 6 and 8 mean scores above 3.50 thus, these items were accepted as factors affecting the engagement of female in engineering. The respondents had neutral...
views on item 4 (mean scores range of 2.50 – 3.49), while the rest of the items (mean scores range of (0.50 – 2.49) were rejected. In Table 2 Question 2, the data analysis showed that only one item (11) was accepted by the respondents as factors that keep them [females] motivated to continue in the engineering programme in the institution where the study was conducted. The remaining four items (12, 13, 14 and 15) were rejected.

4. CONCLUSION

The findings of this study concluded that female engineering students encounter a number of challenges that need to be addressed. The challenges are diverse and rise from a number of sources. Most of the challenges indicated by female students in engineering programmes are not necessarily unique to them; those challenges may be affecting male engineering students as well as students from other faculties of the university. The study also confirmed that female engineering students are motivated by certain factors that enable them continue in their engineering programmes. In particular, the findings showed that discouragement from people have little effect on the determination of female in STEM.

5. RECOMMENDATIONS

There are many factors to address in order to fix the issues of women in STEM, and it is beyond the scope of this research to provide a comprehensive solution. Instead, we will recommend some interventions and restorative strategies that would make a positive impact on women in STEM.

1. Government should improve the learning environment with engineering facilities to execute activities such as include investigative learning, laboratory experience field trips and collaborative work for real life projects, which are important to help engineering students to understand abstract theories and mechanisms related to engineering.

2. Parents and relatives should not discourage the ambitions of female wards from pursuing science courses which may lead to a study of engineering in higher institutions.

3. Women in engineering bodies in Nigeria should visit schools to be role models and counselors to equip female students with knowledge to deal with challenges in engineering programmes.

4. There is need to create programmes for engineering awareness from pre-tertiary levels through guidance and counseling services functional in all educational levels to ensure students get enough information to make the right career choices for themselves. This will create positive perception of engineering careers in the mindset of girls and women.

REFERENCES


NIGERIAN WOMEN WORKPLACE RIGHTS: THE PRESENT LEGAL REALITY

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ABSTRACT

Women have been on the receiving end of imbalance in the workplace. These discriminatory factors have limited their full potentials or prevented them from effectively combining being mothers and career women. The existing laws and societal mindset have not in their entirety provided the framework needed for women to excel on the same pedestal as men. In a similar vein, companies or organizational policies have failed to accommodate regulations that would aid the performance of the woman at work. This paper examines the rights of women, the challenges faced by them at work; and the negative impact of such challenges which inadvertently prevent them from enjoying their constitutionally-guaranteed rights. The research was carried out with reliance on both primary and secondary data from legislations, judicial precedents, published articles and research journals. It anchors its conclusion and recommendation on the need for new laws and organizational policies that protect the working Nigerian woman.

Keywords: Discrimination, Gender, Rights, Sexual Harassment, Maternity Protection

1. INTRODUCTION

A woman is pre-conditioned from birth to be: the weaker sex; the primary care giver; a helpmate, a second-class citizen in a patriarchal society. The diverse roles foisted on her only serve to underline her disadvantage as a woman. Nigerian women had until few decades ago lived as wives and mothers in a full-time capacity, taking care of the home and their children. The man was traditionally cast in the role of breadwinner. Colonial heritage served to solidify what was already rooted in culture. Many of the jobs were the exclusive preserve of men. The imbalance in the ratio of men to women in paid employment was staggering and even in recent times, the gap is barely closing. In the 2018 report of the World Economic Forum, Nigeria ranked 133 in closing the gender gap among work managers and legislators. This is a drop from its 2017 ranking of 122 out of 144 countries.

This paper explores the challenges of women in paid employment. These challenges range from gender inequality, pay parity, to sexual assault, discrimination as a result of pregnancy, and inadequate maternity leave. It also considers whether existing laws and international treaties have served to impact positively on Nigerian women’s rights.

2. THE CONCEPT OF WOMEN’S RIGHTS

According to Merriam-Webster Dictionary, women’s rights refer to the legal, political, and social rights for women equal to those of men. Women’s rights simply put are “human rights, for women. These rights include the right to social, economic, medical, and political self-determination, and to equal treatment under the law.” Essentially therefore, women’s rights draw its validity from fundamental human rights of citizens. Its activists seek empowerment and positive change for women, while encouraging them to make personal choices for their own well being. The concept of women’s rights advocates freedom from every sort of discrimination as a result of their gender. The Universal Declaration on Human Rights equally guarantees equality in the rights of

2 World Economic Forum Global Gender Gap Insight Report 2018 p.27
3 Retrieved from www.merriam-webster.com on the 7th of July, 2019
5 Retrieved from beijing20.unwomen.org on the 7th of July, 2019

1st National Conference of WITED, Ilaro Chapter
both men and women. In 1979, the General Assembly of the United Nations adopted a Treaty that promotes the rights of women popularly known as CEDAW (Convention on the Elimination of All Forms of Discrimination Against Women). CEDAW seeks to put an end to all forms of discrimination against women and among other things, abolish all forms of laws that promote discrimination against women; promote the enactment of laws that protect girls’ and women’s rights in the various countries of the world and “ensure elimination of all acts of discrimination against women by persons, organisations or enterprises.” The Treaty has been ratified by 189 countries with Nigeria ratifying it in 1985. Sadly, the country is yet to exercise its prerogative as provided for under section 12 of the Nigerian Constitution to adopt CEDAW as a local law or better yet make laws that largely if not in totality mirror CEDAW. The closest Nigeria has to prohibiting discrimination against women is contained in Constitution.

“A citizen of Nigeria of a particular community, ethnic group, place of origin, sex, religion or political opinion shall not, by reason only that he is such a person-

a. Be subjected either expressly by, or in the practical application of, any law in force in Nigeria or any executive or administrative action of any government, to disabilities or restrictions to which citizens of Nigeria of other communities, ethnic groups, places of origin, sex, religions or political opinions are not made subject; or

b. Be accorded either expressly by, or in the practical application of any law in force in Nigeria or any such executive or administrative action, any privilege or advantage that is not accorded to citizens of Nigeria of other communities, ethnic groups, places of origin, sex, religions, or political opinions.”

The Labour Act defines workers as employees who perform manual labour or clerical work while employees are non-workers who perform administrative, executive technical or professional functions. Women fall into either categories.

3. NIGERIAN WORKING WOMEN—THE PERENNIAL ISSUES

Working Nigerian women have over the years formidably increased owing to improvement in qualifications and the economic reality that family income needs to be augmented. However, they have had to deal with the consequences of foraging into employment or business by being by-passed for men who are less qualified for the same role. The fundamental challenges encountered by women at work have contributed in compelling them to make the tough choice of having a successful career at all costs or building a home. Women who choose the former are perceived as cold, inhuman who give up what is most important in life to swim in waters exclusively designed for men to excel in. Some of the issues are discussed below:

1. SEXUAL HARASSMENT AT WORK

Many women have at one time or the other faced harassment or assault in the workplace with many suffering in silence. Sexual harassment is defined by CEDAW to include “such unwelcome sexually determined behaviour as physical contact and advances, sexually coloured remarks, showing pornography and sexual demands, whether by words or actions… It is discriminatory when the woman has reasonable ground to believe that her objection would disadvantage her in connection with her employment, including recruitment or promotion, or when it creates a hostile working environment.”

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6 Ibidem
8 Retrieved from www.ua.undp.org “Six things you need to know about CEDAW (and women’s rights) in Ukraine.” 30th January, 2017
10 “The Women’s Convention in Nigeria” 14th October, 2017 Retrieved from ng.boell.org on the 4th of July, 2019
11 Section 42 CFRN 1999
12 Section 91 of the Labour Act
14 General Recommendation 19 to the Convention on the Elimination of Discrimination Against Women
The International Labour Organisation\textsuperscript{15} states that sexual harassment is a form of violence against women. Sexual harassment covers a wide range of activities. “Therefore, behaviour which may appear relatively innocent (such as joking, innuendoes, flirting and asking someone on a date) to behaviour which is blatantly illegal such as forced fondling, attempted or actual rape and sexual assault) can all constitute conduct of a sexual nature…to qualify as sexual harassment the behaviour must be deliberate and/or repeated.”\textsuperscript{16}

There are 3 types of workplace sexual harassment\textsuperscript{17}:

a. Offensive working environment: In this case, unsolicited requests for sexual favours, sexual advances, physical and verbal sexual conduct are exhibited towards the victim. For instance questions about her sex life, comments about clothes and appearance.
b. Physical abuse: This entails bodily contact inclusive of unwarranted touching, brushing against, caressing or hugging, sexual assault and rape.
c. Quid pro quo: Your participation in the sexual harassment is considered a condition for any benefit which would have ordinarily been entitled to in the job like promotion, getting employed, etc.

As earlier noted, quite a number of sexual harassment complaints are lodged by women\textsuperscript{18}. A 2010 study conducted on working Nigerian women showed that a principal source of sexual harassment is the boss.\textsuperscript{19} The wave of #MeToo movement which commenced in 2017 in America eventually found its way to Nigeria in 2018, with many victims of sexual harassment opening up on social media about their harassment at work.

THE INTERVENTION OF RULES AND LAWS ON SEXUAL HARASSMENT

Section 34 of the Constitution provides that “Every person is entitled to respect for the dignity of his person and accordingly- (a) no person shall be subjected to torture or to inhuman or degrading treatment;....” Sexual harassment has the negative impact of violating the victim’s dignity.\textsuperscript{20}

The Criminal Laws of Lagos State\textsuperscript{21} provides that anyone who sexually harasses is criminally liable to imprisonment for 3 (three) years. This is however applicable only in Lagos and not the entirety of Nigeria. Beyond the aforementioned provision, the country is bereft of a law with a nation-wide reach that criminalises the act.

The National Industrial Court “NIC” is conferred jurisdiction on labour and employment related matters by virtue of the provisions of s.254 of the Constitution as amended by the Third Alteration Act of 2010. The aforementioned section\textsuperscript{22} confers exclusive jurisdiction on the court on sexual harassment related issues at the workplace. On the basis of the constitutional provision, the NIC gave A 2016 judgment in favour of the plaintiff in the case of Pastor (Mrs.) Abimbola Patricia Yakubu v Financial Reporting Council of Nigeria & Anor\textsuperscript{23}. According to the plaintiff, she relentlessly suffered from sexual gestures, compliments and obscene talks coupled with demand for sex and indecent marriage proposal all from the second defendant while employed by the first defendant. In its judgment, the court held that the plaintiff’s right to human dignity was violated. Damages in the sum of N5,000,000 (five million naira) was awarded in her favour.

The Labour Act is silent in respect of provisions on sexual harassment. This downplays the significance companies, businesses and organisations tend to attach to the ubiquitous act.

2. PREGNANCY DISCRIMINATION/MATERNITY PROTECTION

\textsuperscript{15} ILO Discrimination (Employment and Occupation) Convention (No.C111)
\textsuperscript{17} How to handle Sexual Harassment at Work in Nigeria 3\textsuperscript{rd} July, 2019 Retrieved from lawpadi.com on the 7\textsuperscript{th} of July, 2019.
\textsuperscript{19} Ibidem at p. 185
\textsuperscript{20} Sexual harassment in the workplace/Turning the tables: ending sexual harassment at work 27\textsuperscript{th} March, 2018 Article retrieved from www.equalityhumanrights.com on the 7\textsuperscript{th} of July, 2019
\textsuperscript{21} Section 262
\textsuperscript{22} Section 254 (c ) (1) (g)
\textsuperscript{23} Suit No NICN/LA/673/2013
Nature designed the woman to be the pregnant partner, with the instinctive enduring ability to carry a child to term. This natural development is socially sanctioned by society. However, the cons of it are borne exclusively by the woman. Equality of the genders simply emphasizes that the woman has the right to enjoy the same rights enjoyed by a man. It is for instance, a woman’s right to choose to be pregnant and work simultaneously. She also has the right to maternity leave. According to Mahmoud, women have the fundamental human right of protection while pregnant and at childbirth. The International Labour Organisation, is concerned with providing the maternity protection of maternity employees in any organisation. Some of elements to maternity protection include:

- Protecting the health of pregnant and breastfeeding women and their children from workplace risks;
- Protecting from work discrimination and dismissal;
- Medical care;
- Maternity leave;
- Cash benefits to help the mother support herself and the child while on leave;
- Breastfeeding on return from work.

Despite the stance of the ILO and its conventions on Maternity protection, women are still discriminated against at work on account of their being pregnant. There are companies with policies that prohibit pregnancy for a certain number of years after the woman commences work. Those who fail to comply are sacked or penalized. Some organisations are reluctant to employ pregnant women. Unfortunately, the existing law does not provide protection for these women. The Labour Act does not have comprehensive provisions in respect of protection of pregnant women. It only addresses issues of the number of weeks a woman on maternity leave is entitled to. It also states that nursing mothers are to be entitled to 1 hour of breast feeding per day while at work. Section 54(4) prohibits the dismissal of a woman from maternity leave as a result of her absence from work. While it is laudable that certain employers grant more than the 12 weeks leave stipulated in the Labour Act, there are many other organisations that merely grant 6 weeks leave.

The ILO Maternity Protection Convention 2000 (No 183) being the third in a number of maternity protection conventions provides that women are entitled to 14 weeks maternity leave. This underlines the fact that Nigeria’s law is the minimum standard in respect of maternity leave. Owing to the fact that a woman is under risk when pregnant and even during and after childbirth, it behoves on government to provide a more comprehensive legal framework to protect women who pass through this phase. Failure to guarantee such protection usually leads to women resigning from such jobs. Laudably, Lagos State civil servants are entitled to 6 months maternity leave with the fathers equally entitled to 10 days paternity leave. The Kaduna State government recently announced that women in the state will start enjoying 6 months leave. Presently, federal civil servants are entitled 4 months leave to be taken not less than 4 weeks before the anticipated due date. The Kaduna state government recently joined its Lagos State counterpart to grant mothers 6 months maternity leave.

The United States of America has the Pregnancy Discrimination Act of 1978 which addresses incidents where the woman is treated differently because she has had a child, or is breastfeeding or is dealing with a condition that arose as a result of having been pregnant or given birth.

3. ON/OFF SITE CRECHE FACILITIES

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27 Section 54 provides the woman is entitled to 12 weeks maternity leave.
28 This Convention has not been ratified by Nigeria.
29 Olubi & Olusegin p.12
30 This practice commenced in 2014.
32 This announcement was made on the 29th May, 2019 inauguration of Governor El-Rufai.
Nothing in the Labour Act mandates an employer to provide a crèche for a nursing mother to be able to quickly access her child and his or her peculiar needs when they arise, particularly during work. However, the reality is that nursing mothers, while given the allowance to breastfeed their babies for an average of 30 minutes twice in a day, they are challenged if the crèche facility is far from their work place. This contributes to the hardship already encountered by them. Many of them deal with this issue by weaning their children off breast milk contrary to the 6 months exclusive breast milk recommended by the World Health Organisation. Others choose to battle with the tedium of rushing between a far flung crèche and their work place. This tends to pile up the amount of stress women are subjected to everyday. Inadvertently, their productivity level will be grossly impaired. Very few employers have crèche facilities on the same premises as the workplace.

4. PAY PARITY OR LACK OF IT

A woman is entitled to equal pay with her male counterpart on the same cadre. Inequality in wages is an act of discrimination. One of the challenges of being a working woman is the tendency to be underpaid as compared to males. This was a generic issue in America until the Equal Pay Act of 1963. The purpose of the Act is to eliminate unequal wages as a result of gender discrimination. Unequal pay was rooted in American employment policies with women earning mere 77 cents for every dollar a man earned.33 In 2009, the Lily Ledbetter Fair Pay Restoration Act was signed into law by President Obama.34

Section 17(3)(e) of the Nigerian Constitution provides that “The State shall direct its policy towards ensuring there is equal pay for equal work without discrimination on account of sex, or any other ground whatsoever.”35 Policies and laws on equal wages are therefore the responsibility of government. Presently, there is no law on equal wages though a bill on same has been at the National Assembly since 2008.36 Of note also is the Gender and Equal Opportunities Bill which the Senate refused to pass in 2016. Though more women are working as compared to before, many of the management cadre positions are occupied by men, thereby causing a disparity in wages.37 Seemingly, in Nigeria, salaries are paid depending the employee’s level or position in the civil service or even in the private establishment.

4. CONCLUSION AND RECOMMENDATION

The disparities between the lives of a working male and female have been reiterated time and time again by the challenges peculiar to women. While it has generated enough discourse, it is high time government addressed the concerns of sexual harassment, unequal pay maternity protection and other social issues encountered by women.

1. Legislations should be enacted and bills such as the Equal Opportunities Bill be passed into law to promote the rights of women.
2. Nigeria should exercise its role as provided under s.12 of the Constitution by adopting the CEDAW Convention to improve the lives of women.
3. Organisations should develop and evolve policies on sexual harassment and other forms of sexual violence against women in order to protect the females and to guarantee a secure working environment free of predators.
4. Companies and institutions should make provision for on-site crèche/breastfeeding facilities to assist women nurse their children. Healthy mothers and babies translate into efficiency at work.
5. Existing laws such as the Labour Act should be amended to take into cognizance the realities of the day. Fines should be reviewed to reflect the current economic changes of the country.

33 Retrieved from www.eeoc.gov on the 7th of July, 2019
34 The Act overturned the position of the Supreme Court where there was restriction on the period of time for filing wages compensation discrimination complaints.
35 Section 6(6)© of the Constitution limits the judicial powers of the courts from hearing cases in respect of the justiciability or otherwise of the provisions on the Fundamental Objectives and Directive Principles of State Policy.
36 Labour Standards Bill
37 The National Bureau of Statistics using statistics collected between 2010-2015 reported that 65.3% of top positions are occupied by men in comparison to 34.7% occupied by women. Information retrieved from www.mysalaryscale.com on 4th July, 2019
ABSTRACT

Gender equality or mainstreaming has continued to be a front burner in the public discourse over the years. The concept advocated for more women’s representation in leadership and participation in activities and policy that affect them. This paper examined the concept of gender mainstreaming in the public administrative system of Nigeria, as a solution to problems of effective public policy. The paper explores literature on gender mainstreaming, public administration, model of gender mainstreaming, public policy and anchored the study on feminism theory. The use of internet, journal articles, thesis, government publication, official reports and archival materials assisted in the source of information. The study revealed that despite increased number of graduate female, high disparity in women/men representation noticed contribute to problem of public policy in Nigeria. It was concluded that gender mainstreaming with strong political will, technical capacity with supporting organisational culture for implementation and accountability on implementation will ensure women’s experience and contribution in public policy for effective service delivery and improved standard of living in Nigeria.

Keyword: Gender, Public Administration, Policy, Mainstreaming, Equality, Accountability, Political will, Culture.

1. INTRODUCTION

Public administration at the inception, both in textbook, curriculum and practices, largely overlooked minorities and dismissed contribution that reflected women’s experience. This was evidenced in the early history of United States of America where government declared one half salary for women in government employment on the same job that a man would be paid to perform, until an equality law was enacted in 1963 (Equal Pay Act, 1963). These cultures hold over from early eras have influenced the current inequity in pay, and participation that still exist till today both in United State of America and other part of the world, including Nigeria.

Throughout history however, governmental and agency policies have been developed, implemented and continually revised to address the gender gap and foster equality, especially in the public sector workplace. The focus of gender is not on women per se but on power relations between men and women, their access to resources and decision making power. Agate (2011) argued that equality and gender equality is not the same. While the former advocated for the condition or quality of being equal, agreement in quantity or degree as compared, the later means granting of equal rights and opportunities to both gender, and not emphasizing that men and women are identical being.

Most leadership position is largely occupied by men at the detriment of qualified women around with instance in the present composition of the Executive and legislative arms of government in Nigeria, both at the federal and state level showing a wide margin. Emmanuel (2016) supported the above argument that, data on the gender composition of administrative positions and political position in Nigeria, persistently demonstrated that women are underrepresented at senior management level, with men occupying a disproportionately higher number of positions in both public and private sector.

The argument that women lack basic qualification and experiences to occupy top leadership position cannot stand the test of the present time, with record of women achieving a great feet in academic record and scholarship in various institutions with the country. Still, women are not having equal opportunity to top management position in most organisations, as well as political position in Nigeria which are largely occupied by men. Though, cultural believe especially in Africa, that women are custodian of the homes is another disadvantage, as some of them failed to maintain a balance between the two challenging factors. Emmanuel
(2016) asserts that despite a great number of women graduates, there are few women at senior management level, most as a result of women being compelled to relinquish or interrupt their career for the sake of their family, to strike a balance between family and work.

Moreover, most argument has always supported women representation in leadership position especially in elective posts. There is little or no argument as to gender balance or mainstreaming in our public administrative system, since administrators’ activities exceed implementation, but also professional advices to policymakers in the process of policy formulation. This might provide the solution to challenge of policy summersault being argued by most scholars as the main problem of underdevelopment in Nigeria. Even, there are policies such as child’s care, antenatal and post natal care, counselling, among others, that deserved higher percentage of women for formulation as well as implementation, which is the core function of a public administrators. This paper tends to examine how gender mainstreaming or balance in Nigeria public administrative system can brings about desired result in the policy process vis a vis improved government activities in the area of service delivery.

2. LITERATURE REVIEW

2.1 Concept of Gender Mainstreaming

The concept of gender mainstreaming grew out of frustration with strategies for integrating women into development devised in the 1970s and 1980s that showed a little response towards improving gender equality. Gender mainstreaming term appeared for the first time after the Third World Conference on Women at Nairobi in 1985 and was explicitly adopted in the Fourth World Conference on Women at Beijing in 1995 as a result of the low impact that different policies, programmes and actions were achieving in terms of equality for women in society. Since then, several international and national organisations have adopted a gender mainstreaming strategies (United Nations Development Programme, 2007).

The United Nations Development Programme (UNDP) defines gender mainstreaming as taking account of gender concerns in all policy, programme, administrative and financial activities, and in organisational procedures, thereby contributing to a profound organisational transformation. Gender mainstreaming is a very ambitious concept that requires total commitment, expertise and most of all goodwill from all stakeholders. Gender mainstreaming does not focus solely on the issues concerning women but goes on further to promote equality among individuals, be they male or female. It provides administrative tools to strengthen democratic governance and service delivery. It aims to address gender equality: accepting and valuing equally the differences between men and women and the different roles they play in society. Gender mainstreaming does not address women in isolation but aims for greater equality between the sexes by bringing a gender equality perspective into everyday policy-making and by complementing the existing traditional gender equality structures (Human Right Education Association, 2014).

Rees (2018) identifies the three principles as the basis for gender mainstreaming activity: (a) to regard the individual as a whole person; challenging the traditional role of the bread-winner being the male and the female’s participation in the workforce to be minimal. To regard the individual as a whole means to move away from stereotypes, thus recognising the importance of the work-life balance; (b) Democracy and participation. This principal encourages civic participation in the decision-making processes, involving training in corporate governance, capacity building and allocating resources on the basis of need rather than on historical patterns. This principal aims at creating a culture of equal participation for women and men; and (c) Fairness, justice and equity. The third set of principles act as the social justice driver of mainstreaming, emphasising transparency, gender balance in decision making, equal outcomes and opportunities; thus creating an environment that leads to better governance. Rees (2018) argues that when applying gender mainstreaming practices, one should take into consideration a wider view to promote equality, not just the ability of each individual to perform the task assigned to them. Furthermore, gender mainstreaming incorporates a gender equality perspective into mainstream policies as they are developed, ensuring equal opportunities for all.

United Nations Economic and Social Council describe gender mainstreaming as a strategy for making women’s as well as men’s concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of the policies and programmes in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated (HREA, 2014). Gender mainstreaming is a globally accepted strategy for promoting gender equality. Mainstreaming is not an end in itself but a strategy, an approach, a means to achieve the goal of gender equality with interdependent or complementary roles of men and women are recognised, so that one cannot be changed without also affecting the other; aiming at transforming not only unequal relationships between genders but also the structures that produce inequality. Gender issues are not confined to one sector but must be addressed across the board, gender needs to be
addressed as part of mainstream, “normal” institutional activities and not simply left to specialist women’s institutions. In this regard, this task is the responsibility of the entire organization and cannot be carried out by any single individual or sector.

2.2 Model of Gender Mainstreaming

There are many gender integration frameworks, each organisation using its own. For example, in 1999, Inter Action’s Commission on the Advancement of Women developed the framework which sees integration as an organic process, similar to a living tree as quoted in World Health Organisation, Gender mainstreaming manual in 2016.

At the root of the process is political will. An organization with strong political will, like a tree with strong roots, can support the development of three vital branches:

I. technical capacity,
II. accountability and a
III. positive organisational culture.

All components are inter-related and activities can fall into multiple categories.

I. Political Will

Political will becomes evident when top-level leadership/managers (publicly) support the issue of gender equality and follow up its implementation, e.g. whether they commit staff, time and financial resources, show public support in speeches and written communications, when organisation adopts and advocates a gender policy, and institutes needed policies and procedures, and ways to recognize progress in gender mainstreaming.

II. Organisational Culture

Organisational culture involves progress toward a gender balanced staff and governance structure, equal valuing of women and men in the workplace, among others. This also includes patterns of behaviour and codes of conduct within the organisation that help ensure gender equality, or undermine gender equality – how people relate, what are seen as acceptable ideas, how people are “expected to behave” and what behaviours are rewarded.

This field is also linked to climate of open communication, as well as if the culture of the organisation also reflects how it communicates gender equality and how gender equality is reflected in the internal and external documents of the organisation.

At the governance structure this means ensuring that women and men can participate at different levels of the organisation. It also requires ensuring that, once they are recruited and hired, they receive equitable treatment and opportunities to perform their duties to the best of their ability. In a gender-responsive working environment, all staff members, regardless of sex or position, perceive themselves to be stakeholders in
effectively implementing organizational objectives, with policies and programmes that enhance their ability to do so. These could include instituting paid parental leave (for both sexes), establishing zero-tolerance policies on sexual harassment and adopting gender-responsive language in official communications.

A gender-responsive work environment also considers the different roles men and women play when balancing the dual responsibilities of professional and personal life. Women often have less time to engage in professional duties due to domestic roles. Equitable, needs-based flexible models of work such as telecommuting and flexitime can increase the satisfaction and productivity of both women and men, creating a supportive work environment. This may also require policies that account for the specific needs of women and men such as breastfeeding or accommodating child-care facility hours.

III. Technical Capacity / Gender Competences

Technical capacity, skills and gender competences needed to carry out the practical aspects of gender integration must be developed. This is the aspect that moves organisation beyond awareness to application. This aspect includes staff skills in gender analysis, adoption of systems for gender disaggregated data, and development of gender sensitive tools and procedures. This part involves gender responsive organizational procedures as well as strengthen individual skills, including nurturing an ongoing community of learning amongst staff. Important part of technical capacity is linked to human management. For example, for organisations to take gender mainstreaming seriously, clear human resource plans and strategies must ensure that gender mainstreaming is fully integrated into work plans with the concrete human and financial resources allocated to it. An organisation can assign responsibility for gender mainstreaming in various ways: designate a gender focal point or gender unit; conclude specific activities in the terms of reference of certain staff members; and require gender competencies in recruitment procedures.

IV. Accountability

Because gender integration ultimately involves organisational change, systems of accountability are also essential. Both incentives and requirements are necessary to encourage and reinforce new behaviours, within individuals and within an organisation as a whole. There are the mechanisms by which an organisation determines the extent to which it is “walking the talk” in terms of integrating gender equality in its programmes and organisational structures. In this regard, the high leadership needs to demand accountability within their spheres of responsibility for how the strategy has been applied and make sure that consequences are drawn from the results of internal and external evaluations and appraisals. This shows that the organisation expressly wishes efforts to be made to promote gender equality and supports such efforts accordingly. Example of accountability would be to also set and assess annual targets for implementing a gender strategy. Another opportunity to increase accountability in this field is to build gender equality into job descriptions, work plans, and performance assessments. A positive action in this field is also, for example, if organisation’s documents and rewards progress in the field of gender equality (e.g. GIZ every two years, holds a company-wide Gender Competition, with awards for special approaches in this field).

2.3 Concept of Public Administration

Public Administration has been defined by various scholars, all centered on the government actions or inactions for changes in the standard of living, governance, politics and economy. The most common and first definition of Public Administration given by the father of the study Woodrow Wilson, that, public administration is the detailed and systematic application of law (public policy), shows that public administrators are machinery for executive arm of government for carrying out their action plan. Professor V. Bariss was quoted in Agate (2011) that public administration is the use of management, politics and legal history in order to implement the mandates of government legislation and its fulfilment, which ensure the provision of functions of regulations and services to the society or a part of it.

F. A Nigro and LG Nigro asserts that public administration is a cooperative group effort in a public setting that covers all three branches, that is, executive, legislative and judicial and their interrelationship, which has important role in the formulation of public policy and is closely associated with numerous private groups and individual in providing services to the community (Naidu, 2006). Public administration activities have a significant impact on daily life. They determine the way political and economic decisions made by governments are implemented and how budgets are allocated and spent. For this reason, the equal participation of women and men, especially at decision-making levels, is a necessary condition for inclusive and gender-responsive public administration systems.
2.4 Concept of Public Policy

In Carl J. Friedrich's opinion public policy is a proposed course of action of a person, group or government within a given environment providing opportunities and obstacles which the policy was proposed to utilise and overcome in an effort to reach a goal or realise an objective or purpose. From these definitions, it is clear that public policies are governmental decisions, and are actually the result of activities which the government undertakes in pursuance of certain goals and objectives. It can also be said that public policy formulation and implementation involves a well planned pattern or course of activity.

Public policy making can be characterized as a dynamic, complex, and interactive system through which public problems are identified and countered by creating new public policy or by reforming existing public policy. Public problems can originate in endless ways and require different policy responses (such as regulations, subsidies, import quotas, and laws) on the local, national, or international level. Government holds a legal monopoly to initiate or threaten physical force to achieve its ends. Public policy making is a continuous process that has many feedback loops. Verification and program evaluation are essential to the functioning of this system. The public problems that influence public policy making can be of economic, social, or political nature. Each system is influenced by different public problems and issues, and has different stakeholders; as such, each requires different public policy. In public policy making, numerous individuals, corporations, non-profit organizations and interest groups compete and collaborate to influence policymakers to act in a particular way (Pellisery, 2015). The above justifies the involvement of all, both men and women to formulate and especially implement policy that will bring about desired change in the life of the people.

2.5 Problems Associated with Gender Equality in Nigeria

Emmanuel (2016) identified seven major reasons for the lack of substantial progress being made in gender equality at the workplace: (a) differing perceptions of the problem. He also argues that despite overwhelming evidence that gender imbalance is entrenched in organisations, many men persist to view organisations, bureaucracy, and leadership hierarchical structures as being gender neutral phenomena; (b) opposition of men who do not want to treat women as equals in the workplace.

These men believe that women are less suited for roles that require leadership; (c) the private-public dichotomy. This is the belief that men and women should be of equal rank in the family domain (the private sphere), but they should be of different rank on the job (the public sphere), with women being on the lower organisational leadership hierarchical rung; (d) the debate over essentialism and malleability of gender. This is the belief that women are somehow better than men in some matters or that men make better leaders than women, and that women and men tend to differ consistently from each other in predictable ways; (e) the dilemma of professional autonomy. Literature illustrates that while many women believe that high-quality teamwork attains productive work, men are more likely to value self-directed problem solving and are less likely to accept the joint problem solving concept. This attitude unjustifiably limits women from demonstrating and gaining recognition for their ability to work with men and taking a leadership role; (f) failure in action. Emmanuel (2016) argues that while many men do not consciously oppose gender equality in the workplace, these men take a passive approach to the issue. Hence, the reason for the discrepancy between what is acknowledged and what is practiced; and (g) the time-lag for the democratic process to work. The literature illustrates that the time involved in executing the democratic process from the decision phase to actual implementation of gender reforms has sustained the hesitant and incremental approach to the integration of women at all levels of organisations.

2.6 Theoretical Framework

Feminist theories first emerged as early as 1794 in publications such as A Vindication of the Rights of Woman by Mary Wollstonecraft, "The Changing Woman "Ain't I a Woman", "Speech after Arrest for Illegal Voting", and so on. "The Changing Woman" is a Navajo Myth that gave credit to a woman who, in the end, populated the world. In 1851, Sojourner Truth addressed women's rights issues through her publication, "Ain't I a Woman". Sojourner Truth addressed the issue of women having limited rights due to men's flawed perception of women. Truth argued that if a woman of colour can perform tasks that were supposedly limited to men, then any woman of any colour could perform those same tasks. After her arrest for illegally voting, Susan B. Anthony gave a speech within court in which she addressed the issues of language within the constitution documented in her publication, "Speech after Arrest for Illegal voting" in 1872. Anthony questioned the authoritative principles of the constitution and its male-gendered language. She raised the question of why women are accountable to be punished under law but they cannot use the law for their own protection (women could not vote, own property,
Feminism as a political movement first emerged in Europe in the 16th and 17th centuries. This period was similar to the enlightenment, which grew from such political movements as liberalism, conservatism and socialism. That was regarded as the first feminism-wave depending on the existing political ideas. Liberal feminism emerged as the first one, then came Marxist, socialistic, radical and other types of feminism. Liberal feminism theory supports the idea that the roles of male and female gender cannot be interpreted from biological point of view, they have formed through socialization process (Moore, 1994). This type of feminism is reprimanded for its superficial approach to global female problems by focussing, for example, only on family or mass media. Theory of Marxist feminism relates female problems to capitalism (Moore, 1994). Women are regarded as reproductive agents who produce and take care of the future labour generation in capitalism by introducing ductility. This movement of feminism is reprimanded for its simplified feminist interpretation in capitalism. Theory of radical feminism (also social feminism) mentions that the reason of women oppression is men, their enforced power and self-enrichment at the expense of women, also fight against the violence towards women (rape etc.) attributed by men to show their power in the society (Moore, 1994). According to this theory, the situation in society cannot be changed because men have created the system we live in and are in its leadership.

Theory of dual system offers a more profound analysis on women’s role in society and problems thereto. It provides a combination of radical and Marxist feminism elements by emphasizing that women have a place in capitalism, yet women are oppressed also by men. The role of a housewife and mother restricts woman’s opportunities in professional life. A situation where a man is viewed a servant of capitalism by oppressing a woman, without any chances to treat a woman differently, may be considered a drawback of the dual system theory. Black feminism (also called multiracial feminism) supports African-American and Asian women, to which ethnocentric role is also being attributed (Moore, 1994). Yet, the overall idea of feminism remains unchanged – the emphasis is put on gender equality, not on the superiority of women.

3. DISCUSSIONS

Gender issue has become multidisciplinary discussion almost in all field of human endeavour. This shows the relevance of women’s representation and experience on all matters that will improve the standard of living of people and contribute to national development. The study discovered through content analysis of the literature that women are underrepresented in leadership position, managerial and political, as well as in the core public administrative system in Nigeria and other part of the world. This is in no small measure affect the effectiveness of policy making, implementation and evaluation for economic and national development.

The study affirms that despite increased in women graduate in the society, the undeserved discrimination against women due to culture, family life and religious belief affect their chance to be part of decision makers on matters that affect them. The problem of public policy in Nigeria cannot be ameliorated if all actors, including women are not involved.

4. CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

Women comprise a large segment of the available managerial talent across the globe, yet their representation at top level managerial positions in business and public administration, is rather obscure. Especially, under the crisis, it is of crucial importance to apply all the resource available in the society, including human resources, in order to be more efficient at work and achieve good results. Therefore it is utterly important to evaluate and provide equal opportunities in public administration for both genders because gender discrimination causes also economic consequences in effect as well as defect in national development.

4.2 Recommendations

The study recommended as follows:

- Government should ensure formulation of policy that will prevent discrimination against women for leadership position as well as employment in the public administration.
- Women should be given equal education and support as men, to ensure quality contribution on national matters.
- Women should organise themselves in groups to support any noticed discrimination against their gender.
In formation of policy that relates to women matter, more representation of the gender should be considered for effective public policy.

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*1st National Conference of WITED, Ilaro Chapter*
KNOWLEDGE AND TREATMENT SEEKING BEHAVIOUR OF PEOPLE IN NIGERIA-BENIN BOARDER COMMUNITY OF OJA-ODAN, YEWA NORTH LG, NIGERIA.

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ABSTRACT

The scourge of malaria infection in Africa remains despite all effort to combat the disease. The research investigated the knowledge and treatment practices in a boarder community of Oja-odan, Ogun state, Nigeria. It employed a cluster sampling method to recruit respondents that are 300 in numbers. Findings indicated that the knowledge about malaria among the populace was at an average of 151 (50.3%), while 111 (37.0%) are of the opinion that stagnant water is the breeding site for mosquito, 50% of the respondents are of the opinion that the highest transmission period is rainy season. While the majority of them preferred purchasing of the drugs from Pharmacy, Artemisinin combination therapy (ACTs) is the most preferred antimalarial drug (130, 65%). Majority of them have dual citizenship of Nigeria and Benin republic. While the respondents claimed to be listening to radio stations of both countries as a result of proximity, this does not in any way affects their opinion about treatment or the choice of antimalarial drugs. The reason for this could be as results of both countries have the same treatment regiments for malaria. While the efforts in educating populace on common cause and treatment of malaria is yielding fruits, government and other stakeholders must make the drugs for the treatment of malaria lie majorly in the hands of professionals in government hospitals.

1. INTRODUCTION

Malaria remains an important public health concern in countries where transmission occurs regularly, and in areas where transmission has been largely controlled or eliminated (Bioland, 2001). Malaria is a complex disease that varies widely in epidemiology and clinical manifestation in different parts of the world. This variability is the result of factors such as the species of malaria parasites that occur in a given area and their susceptibility to commonly used or available antimalarial drugs. Also, the distribution and efficiency of mosquito vectors, climate and other environmental conditions contribute to distribution of malaria (Bioland, 2001).

It has been established that malaria prevalence in border communities is often higher than in hinterlands and this is due to various factors which include lower access to health services, treatment-seeking behaviour of marginalized populations that typically inhabit border areas, difficulties in deploying prevention programme to hard-to-reach communities, often in difficult terrain, and constant movement of people across porous national boundaries and importation of drug resistant strains (Wangidi et al., 2015). Also, cross-border human mobility could, pose a major challenge to malaria programming since neighboring country’s preferences are unlikely to align (Khadka et al., 2018). Border malaria occurs because the contiguous areas share a common ecology, with frequent mixing of people, parasites, and vectors most especially those that share a common ancestry, cultural heritage, and malaria ecology (Al-Zahrani et al., 2018).

Accounting for human population movement (HPM) in planning for control, elimination and post-elimination surveillance is important, as evidenced by previous elimination attempts that were undermined by the reintroduction of malaria through HPM. Strategic control and elimination planning, therefore, requires quantitative One of the critical keys to the elimination or transmission reduction of malaria is planning for control, elimination and post-elimination surveillance is important, as evidenced by previous elimination attempts that were undermined by the reintroduction of malaria through Human population movement. Therefore, information on HPM patterns and the translation of these into parasite dispersion is needed for the control of malaria. According to HPM patterns vary substantially by time scales, spatial scales, motivations for travel and socioeconomic and demographic characteristics of traveler (Edmonston & Michalowski, 2004). Over the past decade African countries have transitioned from CQ or SP to artemisinin-based combination therapies.
(ACTs) as a first-line policy for uncomplicated malaria. The transition from CQ took place in most African countries in the late 1990s and 2000s (O’connell, et al., 2011). The study aimed to elucidate the knowledge about malaria treatment and influence of cross border information on treatment and malaria perception.

Study Area

Oja-odan (Oja-odan) is a populated place (class P - Populated Place) in Ogun State (Nigeria). It is located at an elevation of 36 meters above sea level and its population amounts to 71,657. Its coordinates are 6°52'60" N and 2°51'0" E in DMS (Degrees Minutes Seconds) or 6.88333 and 2.85 (in decimal degrees).

The journey to Benin republic through various route available from Oja-odan is a short distance of less that 30 minutes depending on the route one takes and across to Igolor, a small but bustling town in Benin. Most of the residents have unofficial dual citizenship of the two countries whether by birth or intermarriage. Tran’s border trade and farming are the two main occupations of the inhabitants.

2. STUDY DESIGN

The study employed a cluster sampling method to recruit respondents for the study. Oja-odan is a heterogeneous community made up Yoruba ethnic group of Nigeria and Benin republic and other ethnic group of Hausa and Ibo of Nigeria. The settlement was divided into eight clusters separated by definite geographical marks. Simple two-stage cluster sample was used. In the first stage, four clusters were selected by simple random sampling (SRS). In the second stage, the units (elements) in the selected clusters of the first-stage are then sampled by simple random sampling. In each house a family was selected preferably the male head of the house but in absence of the male head, a female preferably wife was interviewed.

The questionnaire sought information on respondents’ socio-demographic variables, knowledge of malaria prevention and treatment including use of drugs and insecticide treated nets (ITN). In addition, the respondents were asked how the latest episode of fever was treated.
3. **RESULTS**

Table 1: Respondents’ awareness on the use of new anti-malarial drugs in relation to their socio-demographic characteristics (n=300)

<table>
<thead>
<tr>
<th>Status</th>
<th>F</th>
<th>%</th>
<th>Significant test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-28</td>
<td>77</td>
<td>33.2</td>
<td></td>
</tr>
<tr>
<td>29-38</td>
<td>61</td>
<td>26.3</td>
<td></td>
</tr>
<tr>
<td>39-48</td>
<td>30</td>
<td>12.9</td>
<td>$\chi^2 = 30.56$</td>
</tr>
<tr>
<td>49-58</td>
<td>27</td>
<td>11.6</td>
<td>$P = 0.167$</td>
</tr>
<tr>
<td>59-68</td>
<td>24</td>
<td>10.3</td>
<td></td>
</tr>
<tr>
<td>69-78</td>
<td>12</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>&gt; 79</td>
<td>1</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>43</td>
<td>14.3</td>
<td>$\chi^2 = 7.02$</td>
</tr>
<tr>
<td>Married</td>
<td>219</td>
<td>73.0</td>
<td>$P = 0.856$</td>
</tr>
<tr>
<td>Divorce</td>
<td>19</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>Widow/Widower</td>
<td>19</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>105</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>68</td>
<td>22.7</td>
<td>$\chi^2 = 28.9$</td>
</tr>
<tr>
<td>Junior Secondary school</td>
<td>16</td>
<td>5.3</td>
<td>$P = 0.089$</td>
</tr>
<tr>
<td>Senior Secondary school</td>
<td>81</td>
<td>27.0</td>
<td></td>
</tr>
<tr>
<td>Tertiary school</td>
<td>14</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>No response</td>
<td>16</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trading</td>
<td>175</td>
<td>58.3</td>
<td></td>
</tr>
<tr>
<td>Artisan</td>
<td>39</td>
<td>13.0</td>
<td>$\chi^2 = 34.56$</td>
</tr>
<tr>
<td>Farming</td>
<td>39</td>
<td>13.0</td>
<td>$P = 0.023$</td>
</tr>
<tr>
<td>Teaching</td>
<td>13</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Civil servant</td>
<td>8</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>No response</td>
<td>26</td>
<td>8.7</td>
<td></td>
</tr>
</tbody>
</table>

The table shows the socio-demographic characteristics of the respondents in the study area. The age of majority of the respondents (33.2%) fall between 18-28 years, (26.3%) fall between 29-38 years, (12.9%) fall between 39-48 years, (11.6%) fall between 49-58 years, (10.3%) fall between 59-68 years, (5.2%) fall between 69-78 years, and (0.4%) are above 79 years. Findings revealed that (14.3%) of the respondents are single (73.0%) are married, (6.3%) divorced while the remaining (6.3%) of the respondents are widow/widower.

The educational status of the respondents showed that (35.0%) had non-formal education, (22.7%) had primary education, (5.3%) had junior secondary education, (27.0%) had senior secondary education and (4.7%) had tertiary education. Also, the result indicated that (58.3%) of the total respondents involve in trading, (13.0%) are artisans, (13.0%) are farmers, (8.7%) are civil servants, and (4.3%) are teachers.

Table 2: Respondents’ knowledge about symptoms of malaria (n=300*)

<table>
<thead>
<tr>
<th>Responses</th>
<th>no of positive response</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weakness</td>
<td>173</td>
<td>57.7</td>
</tr>
<tr>
<td>Loss of appetite</td>
<td>99</td>
<td>33.0</td>
</tr>
<tr>
<td>Headache and dizziness</td>
<td>136</td>
<td>45.3</td>
</tr>
<tr>
<td>Cold</td>
<td>127</td>
<td>42.3</td>
</tr>
<tr>
<td>Diarrhea and vomiting</td>
<td>57</td>
<td>19.0</td>
</tr>
<tr>
<td>Fever</td>
<td>130</td>
<td>43.1</td>
</tr>
</tbody>
</table>

*Multiple responses allowed.
The response to the knowledge about symptoms of malaria was good with larger percentage of the respondents indicated body weakness (173, 57.7%) as a symptom and this closely followed by Headache and dizziness (127, 42.3%), Fever (130, 43.1%), cold (127, 42.3%), loss of appetite (99, 33.0%) and Diarrhea/vomiting (57, 19.0%).

### Table 3: Respondents’ knowledge about causes of malaria (n=300)

<table>
<thead>
<tr>
<th>Responses</th>
<th>No of positive response</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mosquito bite</td>
<td>151</td>
<td>50.3</td>
</tr>
<tr>
<td>Eating sugary things</td>
<td>12</td>
<td>4.0</td>
</tr>
<tr>
<td>Eating dirty food or Water</td>
<td>57</td>
<td>19.0</td>
</tr>
<tr>
<td>Getting soaked with rain</td>
<td>12</td>
<td>4.0</td>
</tr>
<tr>
<td>Cold or changing weather</td>
<td>27</td>
<td>9.0</td>
</tr>
<tr>
<td>Others</td>
<td>19</td>
<td>6.3</td>
</tr>
<tr>
<td>No response</td>
<td>22</td>
<td>7.3</td>
</tr>
</tbody>
</table>

The table shows mosquito bite has been frequently mentioned (151, 50.3%). While few of the respondents mentioned some indices like eating dirty food, drinking dirty water, changing weather as some of the facts that could lead to the malaria.

### Table 4: Respondents’ knowledge of the factors or conditions that encourage the spread of malaria. (n=300)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Positive responses</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor drainage</td>
<td>101</td>
<td>33.7</td>
</tr>
<tr>
<td>Improper disposal of waste</td>
<td>189</td>
<td>63</td>
</tr>
<tr>
<td>Overgrown bushes</td>
<td>113</td>
<td>37.7</td>
</tr>
<tr>
<td>Stagnant water</td>
<td>111</td>
<td>37.0</td>
</tr>
</tbody>
</table>

*Multiple responses allowed

### Table 5: Respondents’ last episode of malaria attack (N) =300

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last two weeks</td>
<td>69</td>
<td>23.0</td>
</tr>
<tr>
<td>Last three month</td>
<td>53</td>
<td>17.7</td>
</tr>
<tr>
<td>Cannot specify</td>
<td>142</td>
<td>47.3</td>
</tr>
<tr>
<td>No response</td>
<td>36</td>
<td>12.0</td>
</tr>
</tbody>
</table>

Respondents’ last episode of malaria indicated that (69, 23.0%) of them had malaria in the past two weeks, (53, 17.7%) in the last three months while larger percentage of them (142, 47.3%) could not specify the last time they had malaria episode.
Fig 1: shows the respondents’ opinion about the highest season of malaria transmission. The highest percentage of the respondents indicated the peak of transmission to be during raining season and dry season respectively (48.5% and 47.5%).

Fig 2: Those respondents that believe that malaria is a serious ailments is 85.0% and 5.3% of them are of opinion that the ailments is not a serious one, 9.67% could not classified whether the infection is a serious one or not.

Table 6: Respondents school attendance and the choice of anti-malarial drugs(n=294)

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>Statistical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>130 (65%)</td>
<td>69 (34.5%)</td>
<td>$\chi^2 = 2.418$</td>
</tr>
<tr>
<td>Chloroquine</td>
<td>11 (64.7%)</td>
<td>6 (35.5%)</td>
<td>P=0.877</td>
</tr>
<tr>
<td>Others/analgesic</td>
<td>54 (69.2%)</td>
<td>24 (30.8%)</td>
<td></td>
</tr>
</tbody>
</table>

The course respondents school attendance and the choice of malaria were compared, the result showed a significant difference between the choice of malaria drugs and the school attendance.
Table 7: Duration of fever before response by mothers (n=300)

<table>
<thead>
<tr>
<th>Day's</th>
<th>numbers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same day</td>
<td>54</td>
<td>18.0</td>
</tr>
<tr>
<td>Second day</td>
<td>98</td>
<td>32.7</td>
</tr>
<tr>
<td>Third day</td>
<td>79</td>
<td>26.3</td>
</tr>
<tr>
<td>Fourth day</td>
<td>44</td>
<td>14.7</td>
</tr>
<tr>
<td>Fifth day</td>
<td>19</td>
<td>6.3</td>
</tr>
<tr>
<td>No response</td>
<td>6</td>
<td>2.0</td>
</tr>
</tbody>
</table>

The table indicated promptness to the treatment of malaria by the respondents; largest percentage of them (98, 32.7%) indicated the second day of the infection while 54, 18.0% of them indicate treatment on the same day of the malaria episode.

Fig 3: Most of them indicated the choice of ACT as a preferable antimalaria drug treatment (66.33%), sulphadoxinepyrimethamine/Amalar (5.0%) and chloroquine (5.0%) while small proportion of them 8.33% could not actually stated the antimalarial drugs they administered during the episode.

Fig 4: Majority of the respondents have dual citizenship of Nigeria and Benin republic (42.5%), those that claimed of been Nigerians alone are 38.3% while about 20% are of Benin national alone

Table 8: Sources of the drugs by respondents’ (n=300)

<table>
<thead>
<tr>
<th>Variables</th>
<th>numbers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy</td>
<td>202</td>
<td>67.3</td>
</tr>
<tr>
<td>Govt. hospital</td>
<td>35</td>
<td>11.7</td>
</tr>
<tr>
<td>Govt. health center</td>
<td>24</td>
<td>8.0</td>
</tr>
<tr>
<td>Drug hawker</td>
<td>27</td>
<td>9.0</td>
</tr>
</tbody>
</table>

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The number of respondents’ that purchased drugs from retail outlet like pharmacy shop are of higher proportion of 67.3%, government hospital 11.7%, health center 8.0% and from drug hawkers is 9.0%.

Table 9: Sources of awareness on the drug used for malaria treatment (n=300)

<table>
<thead>
<tr>
<th>Sources</th>
<th>frequency (n)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio</td>
<td>14</td>
<td>4.7</td>
</tr>
<tr>
<td>Friends</td>
<td>193</td>
<td>64.5</td>
</tr>
<tr>
<td>Hospital/health centers</td>
<td>92</td>
<td>30.8</td>
</tr>
</tbody>
</table>

The sources of awareness of drugs to be used in treating malaria varies: while 4.7% claimed to have gotten the information through listening to radio, 64.5% said to have obtained the information from friends while 30.8% got aware of the drug used from the hospital/clinic they used.

Fig 5: The fig above indicated different radio of interest of the respondents. The Benin republic radio is the major radio of interest by most respondents and this is closely follow by Nigerian radio while sizeable number listen to both radio station.

4. DISCUSSION

Effort to control malaria needs holistic approach and this range from understanding the knowledge about its transmission, treatment and the pathogenicity. The peculiarities of different environment could many times determine the perception of the disease which could be influenced by culture and social values. The study assesses the influence of cross boarder activities and conflict of information about the knowledge and treatment of malaria. The research among many other things sought to investigate the influences of many factors that are really obtainable in border villages of Nigeria. Among the factors are brisk business peculiar to this environment, cross boarder trading most that are not legal, influence of drug hawker most of them that are imported and not recommended by government of the country but find their way through porous border and compromise of the law enforcement agents.

Oja-odan is an agrarian boarder community with influx of commercial activities taking advantages of closeness to boarder; therefore it is not uncommon for various products including drugs claimed to be treating malaria most that are not recommended for the treatment of malaria by Nigeria health ministry. Also, dual inhabitation of most parents and the brisk business that encourage stipends which school attendance will not offer at early stage of life. This attitude encourages illiteracy and poor understanding of the etiology of the diseases.

Conflicts of information about the efficacy of certain drug in treatment of malaria has been one of the bane of malaria knowledge in boarder communities, this has a result of different policy on the treatment adopted by each communities or country. This information could be emanated through Trans- movement of inhabitant or through media like radio, television even print media. Although among these means of information dissemination, radio has been seen to be the most effective taking advantage of the wide range of people it can reach. Most communities in Africa are not connected to national grids and where it is present, it could be epileptic supply therefore this has made radio which mostly used portable dry cells, a prime medium for educational initiatives, and various health topics.

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Misinformation or information contradiction could influence adoption or policy changes at times especially when the information is not been regulated. In this study the choice of new anti-malarial drug is very high toward the new malaria policy of ACTs, although some mothers were unable to identify the drugs that were used during malaria episode. The majority choice of ACT could be influenced by drug policy of malaria treatment from chloroquine to artemisinin combination therapy which have been adopted by the both countries(Zinson&Cherifath,2017) therefore there is no case of contradiction as many of them claimed to be listening to both radio and other media from both countries.

One of the challenges of the boarder communities is poor access to health facilities and tendencies of been neglected due to possibilities of government been more focus with those in hinterlands. In this study there is a reflection of this, the settlement of Oja-odan according to 1991 census and based on recent population projection is about 79,000 inhabitant, Although few private clinic were there which likely to be charging higher prices for treatment since the presence of government-owned clinic was low. Therefore this could encourage the rate of self-medication and quackery (Strasser,2003).

The use of analgesic is relatively high (54, 18.36%), in treatment of body pain that accompanying malaria and malaria related symptoms although indiscriminately. The use of analgesic in place of antimalarial drugs has earlier been reported by other authors therefore effort must be made in better educational and health promotion exercise.

The knowledge about the causes and predisposing factors of the diseases is very high compare to what was obtainable in a similar environment elsewhere although this does not translate into improvement in treatment practices and health seeking behaviour. This was similar to what was obtained in northern part of Nigeria (Singh,Musa,Ebere,2014). In another similar research work conducted elsewhere, it was concluded that understanding of malaria causes and treatment is much better in urban area than in rural areas this could be due to different exposure, access to information and treatment centers (Yaya, et al.,2017).

Despite all these, there is still an improvement in level of knowledge compare to other places with similar settings this could be due to a recent awareness campaign that took place not quite long in Ogun state, Nigeria where the state government distributed the insecticide treated net and the true indicator of this is, in low episode of malaria in those were tested. Although a sizeable number of the handlers were not using it due to many reason ranges from non- comfortable to use, irritation and nowhere to hangs the net. This opinion by the respondents is similar to another one where it was reported that sleeping arrangement and availability of suitable location to hang the net was an hindrance to possession of ITN in their study areas (Iwashita,et al.,2010).

In conclusion, malaria is a disease that requires holistic approach to combat one of the major factors that encourages the resistance to drug is abuse and trans-border transmission. There is a need for targeted educational programs to increase the communities’ efforts to develop desirable attitude and practices regarding malaria and their participation for malaria control. Also, in order to control malaria infection and to completely eradicate it, cross border collaboration among countries is vital ad there is needs for encouraging operational research that supports these control measures.

REFERENCES


STRATEGIES FOR FEMALE GENDER PARTICIPATION IN SCIENCE AND TECHNOLOGY

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ABSTRACT

Science and Technology have ever been known to be dynamic. Prevalent needs of mankind have always been the catalyst for the advancement of Science and Technology since ages past. Societal backgrounds of different human societies have at various times led humans to think outside conventions to invent various devices to attain stress-free living style among human beings. Every human being has been divinely equipped at birth to think logically in order to resolve various challenges of life as the challenges evolve. This review paper utilized both primary and secondary data collected and analyzed to elicit relevant and useful facts for this study. This paper is set to review the roles played in the past by the women in Science and Technology. This paper being a review paper also chronicles means by which the female gender has contributed to science and technology development over times in the past. Suggestions are also made concerning how to enhance female gender participation in Science and Technology in years to come. This study concluded that for the female gender participation in science and technology to improve significantly, there should be deliberate and conscious efforts at increasing female gender enrolment in science and technology based courses among other recommendations.

Keywords: Strategies, Female-Gender, Participation, Science, Technology.

1. INTRODUCTION

Necessity has been widely accepted to be ‘the mother’ of inventions. Science and Technology has been used globally to solve and unravel mysteries surrounding several needs of mankind since time immemorial. Baskets were devised to solve the problem of carrying items from one point to another in an orderly manner. As a follow-up to the baskets invention was the development of carts of various sizes and shapes propelled on single or double wheels. Shelter against the harsh weather conditions and the attacks of ferocious wild animals of their times moved the early-men to devise thatched roof sheds which later on metamorphosed into walled buildings of various media ranging from wooden-walls to mud-walls, to brick-walls and now concrete pre-cast walls of modern times.

It is noteworthy also that the male-dominated societies of our time have specified less-cumbersome roles for the female gender and believed the male gender are the ones created or equipped naturally to venture into much difficult roles associated with Science and Technology. However, every human being has been divinely equipped since birth to think logically in order to resolve various challenges of life as they emerge. In every human invention, it has been noticed that needs which require satisfaction has driven man to develop new devices. This in the main has led to the invention of light bulbs and electricity to power the bulbs. Communication has come to be what it is today courtesy of advancement in Science and Technology.

Traditionally, till date women in different cultures have been culturally restricted to domestic enterprises or better put, women-folks have been culturally engaged in cottage industries, such as textile-piece-goods dyeing or weaving. Traditional Dyeing and weaving Industry have greatly contributed to Nigeria’s economy aside other benefits like domestic tasks of looking after the babies within the homestead. Beside fulfilling their society imposed domestic functions in their cottage industries, many female gender have proven their mastery of their trade which connotes certain elementary science and technology as much as they are capable of doing.

One cottage industry populated by the female gender in centuries past is the traditional natural – indigo – dyeing crafts among the Yoruba tribes of South-West Nigeria. For many centuries in the past, the Yoruba women have practiced the dyeing crafts to the global admiration of expatriates and European tourists who strived to own samples of these crafts-products in their exquisite ward-robos. It is worth mentioning that the dyeing practices of the Yoruba women were in several ways scientific and technological despite the fact that their practices were devoid of written documents.
The early practitioners of this vocation grew in dexterity and tenacity that the Europeans could not but came back to study the traditional expertise which they later on developed into templates used in initiating the prevailing imitations of local designs using their developed technology of mass production to kill our present day practitioners using only the homegrown science and technology.

Olagoke S.A. (2017) reported that, in the present 21st century, No Nation is expected to be deficient, following the United Nations directives and programmes on issue of development in which there are interventions – (MDGs). In the light of this, I opined that Nigerians should dismantle all barriers of religion or culture from the female gender in order to tap into their potentials. This is already being practiced in some neighboring West African countries. A practical example is the novel feat achieved by a young Ghanaian lady by the name Bernice Dapaah. Bernice Dapaah is already redefining the mode of transportation in Ghana and beyond with her recently developed Bamboo framed bicycles. This latest development has put to rest the erroneous belief culturally that only men can make meaningful impact in science and technology.

2. LITERATURE REVIEW

Available records in the library made mention of several meanings attached to Science and Technology.

What is Science?

Ayelaagbe J.A. (2000) cited by Stanley (2010) affirmed that ‘Science is derived from the Latin word ‘Scientia’ which simply means Knowledge. In addition to this linguistic definition of Science, there have been other definitions by authors of Science textbooks and scientific publications. Abdullah (1987) cited by Jefferson (2016) submitted that “Science means intellectual activity through which man seeks to understand nature. He further stressed that a science teacher sees science as an organized body of knowledge in terms of concepts, theories, generalizations and laws. Other Scholars see science as a tool for achieving technological ends in solving human problems through tentative hypothesis. In another instance some scholars conceived science as a body of knowledge which has been acquired through experimentation. To a layman in the street, Science is anything that makes life enjoyable and comfortable.

From the foregoing statements about science there is an appreciable indication that Science means many things to different people. Conant (1951) quoted by Chapman (2017) once defined Science as an interconnected series of concepts and conceptual schemes that have developed as a result of experimentation and observations which are fruitful for further experimentations and observations.

However, none of these conceptions about science clearly explicates the real nature of scientific enterprise. These shortcomings motivated Oguniyi’s (1988) view reviewed by Salawu (2016) about science being defined as follows, ‘Science is an attempt by human beings to organize their experience about nature into meaningful systems of explanations. Kingsley (2015) summarized by defining Science as asset of activities resulting in testable, falsifiable and verifiable body of knowledge. With these, regularities in nature can be observed and reasons could be advanced. Through this, Scientists are able to formulate concepts, principles, theories and laws, which form a body of knowledge that can be tested, falsified and verified at any time and at any place.

What is Technology?

According to Ayelaagbe J.A. (2000) mentioned by Urevba (2017) the term Technology is derived from the Greek word ‘tecture’ which means ‘Art’ or ‘Craft’. Olatunji R.W. (2017) wrote about the meaning of Technology as being the application of knowledge. He further stated, ‘it refers to “the branch of knowledge that deals with the creation and use of technical means and their interrelation with life, society, and the environment, drawing upon such subjects as industrial arts, engineering, applied science and pure science.. Technology is generally used in either of two or more restricted senses. On the one hand, it refers to all processes that have to do with materials. On the other, and in a much narrower sense, it means the industrial processes that succeeded craft operation. Within the scope of this study, technology would be defined as the application of scientific knowledge to solving human problems.

Relationship between Science and Technology

Cyril (2017) remarked that “the relationship between Science and Technology can be equated to that of two sides of the same coin”. While Science on the one hand is a dynamic human activity concerned with understanding of nature, Technology on the other hand deals with the application of scientific knowledge to
solving problems of life in the society. In the light of this, Technology affords man to interact more effectively with the environment, thereby making life more comfortable for human beings.

It is evident from the foregoing statements that a discourse on scientific literacy or science and society without due reference to technology will be likened to a bird trying to fly on a single wing. No wonder Casmir (2018) rightly posited that ‘Science and Technology are major factors in contemporary life. They serve as agents of social economical change, and are the recipients of change’

3. FINDINGS

This study found out so many female gender doing fantastically well in the field of science and technology in spite of the myriads of barriers placed on the female folks which under normal circumstances are sometimes referred to as ‘the weaker sex’.

In the course of moving round the states to obtain relevant data for this study, contact was made with one Miss Islamiat Adeniran, a female brick-layer who learnt the trade from her biological father. Islamiat is the fifth child in a family with six children, all females. The father resolved to train his daughters in the trade of brick-laying, not buying into the pecuniary disposition of his clansmen that bricklaying is exclusively a male-child’s vocation thus forbidden for the female –folks. Islamiat recalled regretfully what befell her senior sisters upon getting married. Islamiat has scaled up her trade by registering her business of bricklaying with the relevant government agencies with the aspiration that later on in life, she would eventually grow her business to a formidable building contracting firm. Islamiat, after completing her Secondary School education, proceeded to the Government Science and Technical College, Abeokuta. While at the technical college studying Bricklaying, she distinct herself in dedication and commitment to work that made her pooled together seven of her course-mates to form a team of builders consisting of four male and four female building professionals.

Plate 1:

Islamiat is an icon of commitment at the construction site, taking hold of the trowel professionally to register her imprints on the site with well aligned rows of brick-walls and well plastered walls. Wherever Islamiat worked, any first-time observer would notice something different about her skills on display. She has decided to surmount cultural prejudices by dreaming of incorporating her business fully before long.

Kate Osaghie, hails from Benin –City, thus from the Edo tribesmen. She is a Vehicle Mechanic who specialized in maintenance and repairs of Mercedes Petrol engines. She learnt her trade from the Government Science and Technical College, Igarra Road, Auchi, Edo State. She enlisted with then Nigerian Army in the year 1983, where she served as a craftswoman in the Nigerian Army Electrical and Mechanical Engineering Corps for twelve years before disengaging from the Army to float her personal Workshop for Vehicle Maintenance and repairs at Akpa-kpava Road, Benin-City.

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Kate is flourishing city-wide known specialist when it comes to Repairs or Maintenance of Mercedes Petrol-engine vehicles.

Theresa Collins, is a Tiv-lady from Benue State, the fourth out of five children, all females. Her father is a now retired Police Officer who has traversed the length and breadth of the nation – Nigeria. Theresa was trained to be a plumber at the Federal Technical College, Ijebu-Mushin, Ogun State. Theresa used to be the only female student in her class while attending Federal Technical College, Ijebu-Mushin, when there were seventeen other males’ students in the class of 18 students in all. Theresa determined to succeed in her chosen field of study and she was able to realize success as she desired when she secured a huge contract of fitting all plumbing works in an estate located at Lekki Peninsula, Lagos State Nigeria with the assistance of one of her former instructor at Federal Technical College, Ijebu-Mushin who happened to be the Main Contractor commissioned to deliver the Dangote Group’s Staff Quarters at Lekki, Lagos State.

Doyin Ogungbile is a mother of four children, including a set of twins all male. She is the only daughter of her mother whose other eight children are all males. She hails from Ode-Aye in Ondo State. Doyin is a 1992 OND graduate of the then Ogun State Polytechnic now Moshood Abiola Polytechnic, Abeokuta. Doyin Ogungbile built her career with the defunct National Electric Power Authority, Abeokuta Business Unit before being transformed and renamed Power Holding Company of Nigeria (PHCN) in the year 2005 by the Government of Former President Olusegun Obasanjo. Doyin is an exemplary technician who has been physically and practically involved in various electrification projects in various Ogun State communities. She deftly climbs electric High Tension Poles without fear to correct faults and carry out installation tasks as might be deemed necessary. Her services have been continually in demand by the PHCN authorities.
Plate 4:
Mrs. Doyin Ogungbile – Electrical Technician on the pay-roll of IBEDC, Abeokuta since the days of the defunct National Electricity Power Authority after her OND programme at Ogun State Polytechnic now Moshood Abiola Polytechnic, Abeokuta. Picture sourced from the technician’s collection.

4. CONCLUSIONS AND RECOMMENDATIONS

Beyond cultural and religious restrictions placed on the female gender, challenges of the female gender participation are grossly similar to those confronting Technical and Vocational education cum training in general. Issues of dilapidated and near obsoleted training equipment and facilities abound all over the country. This lack of adequate training equipment and facilities culminated in drastic reduction in the enrolment volume of students opting for Science and Technical education in recent times.

Revitalization of the Science and Technology sub-sector will be worthwhile when facilities for training are in place appropriately and the trainers are encouraged to be passionate about their work and stay put on the job of training future generation of practitioners who would not seek greener pasture outside the Science and Technology sector.

Proliferation of Science and Technology Training centres across the nation is herein advocated for believing that in so doing, this will afford future generation Scientists and Technologists, passionate interest to succeed in their chosen field of study and vocation coupled with meaningful patronage will spur more female youths to key themselves into then Science and Technology sub-sector of the Nation’s economy.

Inadequate funding of the Science and Technological Training Centres is an identified major constraint and challenge to quality Science and Technological vocational development. It is this study’s recommendation that this should be adequately addressed and forthwith, should lip-service be paid to this very important sub-sector of the Nation’s developmental pursuits.

Updating the facilities at the training centres together with very good incentives provided the trainers to attract the best brains to this sector with formidable interest in the promotion of this sector’s wheels of progress.
The issues of personal disinterest by the female-folks in Science and Technology will soon be a thing of the past if patronage of female scientists and technologists is given a boost by both private and Governmental agencies across the country.

It is the opinion of this study that when above recommendations are put in place, the future of female gender participants in Science and Technology would soar and new entrants would be encouraged to come on board the sailing ship of Science and Technology in the nearest future.

The traditional religious practices which posit that the female gender in the society should only be seen and not heard require to be jettisoned by modern societies and embrace the civilized norms that afford all gender equal opportunities in Science and Technological field of study as being done currently in the developed nations of Europe and Asia which have seen the female gender being involved in space travels and space explorations. As the popular saying affirms that “What a man can do, a knowledgeable woman can do even better” when given a fair trial.

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INVESTIGATING THE FACTORS HINDERING THE GROWTH AND DEVELOPMENT IN HOSPITALITY INDUSTRY IN ABEOKUTA METROPOLIS, OGUN STATE, NIGERIA.

Aneke, F. O.

ABSTRACT

The study investigated the factors hindering the growth and development in hospitality industry using five selected hotels in Abeokuta. It is an empirical study whose major source of data was based on primary source obtained in a cross-sectional survey of 80 respondents using multi-stage sampling techniques. The study aimed at investigating the major factors hindering the growth and development in hospitality industry. The study employed usage of descriptive statistics to analysed the data generated through the questionnaire administered. The results revealed that there is a significant relationship between the professionalism level and patronage level of respondents in the hospitality industry; also staff professionalism have significant effect on the growth of hotel industry. Based on the research findings it was concluded that the growth and development in hospitality industry is influenced by both internal and external factors. The internal factors identified for this study include quality of effective services to the guests/customers while the external factors identified for this study include finance, competition, infrastructure. Liberalization of the economy either leads to retrenchment or closure of industries that minimizes the number of working class who constitute the major customers of the hotels. The study therefore recommends that the government should provide an enabling business environment that is supportive, facilitative and favorable for business activities to thrive. Hotel industry should maintain cleanliness, promptness in rendering services, high quality products, and freshness in order to attract and retain customers.

Keywords: Development, Growth, Hospitality industry and Investigate

1. INTRODUCTION

The hotel industry in Nigeria is going through an interesting phase. One of the major reasons for the increase in demand for hotel rooms in the country is the boom in the overall economy and high growth in sectors like information technology, telecom, retail and real estate. Rising stock market and new business opportunities are also attracting hordes of foreign investors and international corporate travelers to look for business opportunities in the country.

The hospitality industry includes the hotel and motel, or lodging, trade. As defined by the Council on Hotel, Restaurant and Institutional Education, it also includes food services, recreation services, and tourism. The hospitality industry provides accommodations, meals, and personal services for both the traveling public and permanent residents.

The hospitality industry is one of the world’s largest employers (Reigel, 2016). During the past decade, hospitality and tourism education has grown with the rapidly expanding industry. The tremendous growth of the industry from the 1960s into the 1980s created a favourable environment for the employment and career in hospitality Industry (Barrows, 2014).

Thus the statement of problem of this study can be defined as “factors hindering the growth and development in hospitality Industry” which depends on the innovation and productivity, managerial efficiency, geographic location, internalities which adopted by the organisation to better prepare for adjustment to industry and for career success.

Firstly, lodging industry has been contributed largely to the Nigerian tourism industry. Due to this reason, hotel industry is more aggressively to improve its products and services to serve more customers. Hence, this paper, will determine factors that affect the customer to visit the hotel and find out ways to improve their image. In the meantime, address out the special activities or task by suggesting viable and pertinent administrative techniques for the hotel business in Nigerian.

1.1 Statement of the Problem

There have been concerted efforts to grow Hotel Industries in Nigeria. However, Environmental factors such as national economy, competition, technology, infrastructure, and business environment are some of the most influential factors influencing the growth and the development of the Hotel Industries in Nigeria. On the other hand, the discouraging factors such as insecurity, terrorism threats, inadequate capital, and fear of political
instability associated with general elections in Nigeria are also the factors influencing the growth and development of the hotel industries. The low paying nature of the hotelier profession in Nigeria compared to other countries, lack of government support to the profession, and lack of aggressive take up of the profession by training institutions are some of the reasons there are few Nigerian professional hoteliers Tewani (2019). In addition, hotelier as a profession is not considered as a white collar job in Nigeria hence it has not been fully explored. It is against this background the sought to understand the factors influencing the growth and the development of hotel in the study area and in Nigeria as a whole.

2. LITERATURE REVIEW

The concept of hospitality is reception and entertainment of guest/visitors with liberality and good will Kotler, Bowen,& Markens (2012) The most important aspect of the hospitality refer to warm welcome, reception and cordiality. It is the warm reception, which invariable induces providing a pleasant atmosphere by means of its available facilities and activities (Telfer, 2016).

Hospitality service is about creating a sense of well-being to the guests. It is a feeling that their needs are being met and their business are valued. The hospitality industry consists of broad category of fields within the service industry that includes accommodation, restaurants and bars, event planning, parks, transportation, cruise line and additional fields within the travel and tourism industry. Lashley and Morrison (2010) state that, “hospitality is essentially a relationship based on hosts and guests”. Specifically, hospitality industry is part of travel and tourism industry, but accommodation and catering is a part of hospitality industry, which is limited within the periphery of hotels and catering industries. It ranges from small accommodation to star category hotels and restaurant. It is the industry of providing required and necessary service to the travelers to different purpose, especially for leisure/pleasure activities.

The success of a hotel company depends on a number of external and internal factors. External factors include several macro-environments such as demographic, economic, natural, technological, etc., therefore, companies have little or no control over these factors (Gursoy & Swanger, 2017). Internal factors include various kinds of knowledge, production equipment, buildings, personnel, capital, marketing capabilities, and other company resources that can influence the company level of success. These internal factors can be labelled company competencies (Harmsen, Grunert, & Bove, 2010). Although the external environment influences company success, sustained competitive advantages derive from the internal resources and capabilities (also referred to as core competencies) that a company controls (Barney et al., 2011). The term “resources” includes competencies, assets, capabilities, resources, information and knowledge (Kim & Oh, 2014). Core competencies are those processes, skills and assets within the firm that it relies on to achieve competitive advantages (Olsen, et al.,2012). Therefore, hotel managers should focus on identifying, creating or developing competitive advantages that can be utilized in order to enhance the company’s growth performance and bottom line.

The major competitive methods of the hotel firms include: new product development; strategic alliances; brand repositioning; technological innovation; data base marketing; pricing tactics; diversification; service quality management; employees as important assets; in-room sales and entertainment; conservation/ecology programs; and management information systems (Olsen et al., 2012). Some companies are successful because of the identification of the right success factors and implementation of new competitive methods, while others fail because of their inability to identify and implement the proper strategies. Among the internal strategic factors, the human resources, product development, innovation, technology, customer service, and marketing strategies are considered to have a significant impact on a company’s financial success (Gursoy et al 2017).

Amit and Arun (2015) in their article “Factors influencing financial performance of small hotels in Tanzania” found out the following (internal) factors as affecting profitability and performance of small hotels in Tanzania: low volume and low prices of rentable rooms; high cost of goods sold, and high cost to sales percentages of controllable expenses; limited investment in technology and equipment; lack of product and service variety and quality; lack of formal training and education opportunities for employees.

Another study by Alison and Rivanda (2014) shows the internal and external contextual factors that were found to impact on performance in the small tourism businesses. The internal factors include the owner’s-manager’s management capabilities; ownership and organizational structure; involvement in a range of business activities; and, staff and skills. Gu,Z. (2015) pointed out that size, occupancy, and ownership are not the only factors that may affect the profitability of hotels. Other factors, such as branding, management systems, service quality, franchise status, guest demographics, etc.

The word hospitality and services’ is referred to willing and doing something for somebody in the best way. It is a human behaviour of elegancy that is based upon the theoretical and practical exercise. Hospitality and services
are two sides of coin, without one side the coin remains incomplete. It is about catering services to guests who are away from their home environment and have high expectation and needs of quality products, services and atmosphere.

Hospitality and service is about creating a sense of well-being to the guests, as they become customer wishing to receive the required services. It is a feeling that their needs are being met and their business valued. It is difficult to weigh or measure the hospitality services. It denotes relation between service provider and receiver. The different services in the hospitality industries mean giving guests a little more than they expect. If the guests are ignored, treated rudely or cheated, they are left with negative feelings or anger and frustration, and the future business of the hotel is negatively affected. The study aimed at investigating the major factors hindering the growth and development in hospitality industry in Abeokuta and metropolis.

3. RESEARCH METHODOLOGY

Study Area

This study was carried out in selected hotels in Abeokuta metropolis, areas of Ogun State. Research Population

The target population of this study comprises of all guests and staff of the five (5) selected hotels in Abeokuta Ogun state.

Study design

The study was cross sectional and descriptive in nature and involved guests and staff in selected hotels in Ogun state.

Sampling size and techniques

Five (5) hotels were purposively selected for this research work in Ogun State. A total of 80 respondents were selected through a random sampling technique.

Data collection

A well-structured questionnaire was administered for data collection, questions were asked on areas peculiar to the study; Section A contains the personal characteristics of respondents such as name, Age, Sex and other personal characteristics and section B include the level of staff professionalism, Section C include access the rate of patronage of respondent, Section D include access the managerial factor of staff.

Data analysis

Data collected from respondents were subjected to descriptive statistics using Statistical Packaged, for Social Scientist (SPSS) version 20. Chi-Square ($X^2$) tools was used to test the hypotheses. The degree of freedom was cross checked against the level of confidence throughout the test.

$$X^2 = \text{Chi-square}$$
$$O_i = \text{Observed Frequency}$$
$$E_i = \text{Expected frequency}$$
$$\Sigma = \text{Summation}$$

while the research hypotheses was tested using chi –square.

4. RESULTS AND DISCUSSIONS

Socio-Economic Characteristics of the Respondents

The findings revealed that majority of the respondents were between 26-35 years of age with an average of 30.5 years as presented in table 1.

<table>
<thead>
<tr>
<th>Table 1: Socio-economic characteristics of the respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio-Economic Characteristics</strong></td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>18-25 years</td>
</tr>
<tr>
<td>26-35 years</td>
</tr>
<tr>
<td>36-44 years</td>
</tr>
<tr>
<td>Above 46 years</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
</tbody>
</table>
Marital status
Single 56 70.0
Married 19 23.8
Divorced 4 5.0
Widow 1 1.3

Academic qualification
S.S.C.E 24 30.0
ND/NCE 30 37.5
HND/B.S.c 24 30.0
M.Sc 2 2.5

Length of service
Below 1 year 26 32.5
1-3 years 32 40.0
4-7 years 17 21.3
Above 7 years 5 6.3

Occupation
Reception 12 15.0
Restaurant 21 26.3
Housekeeping 13 16.3
Security 11 13.8
Maintenance 7 8.8
Kitchen 10 12.5
Banquet 6 7.5

Religion
Muslim 28 35.0
Christianity 52 65.0

Total 80 100.0


As evident in Table 1, results revealed that majority of the respondents 62.5% were male’s respondents. This finding implied that both male and female were actively involved in hospitality industries in the study area and variable enhance the growth and the development of the industry. The study findings showed that majorities (70.0%) of the respondents were single. The findings of the study revealed that while the majority (37.5%) of the respondents had N.C.E/O.N.D, about (30.0%) of the respondents possessed secondary school certificate and H.N.D/B.Sc respectively. Majority of the respondents 40.0% had between 1-3 years of experience in their main occupation. In terms of religion, the findings of the study revealed that the majority (65.0%) participating respondents were Christians.

Level of staff professionalism
Table 2: Showing the level of staff professionalism in the study area.

<table>
<thead>
<tr>
<th>Statements</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>Mean</th>
<th>S.deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel staff keep to the their word</td>
<td>46</td>
<td>57.5</td>
<td>31</td>
<td>38.8</td>
<td>3.54</td>
<td>0.57</td>
</tr>
<tr>
<td>Hotel staff are loyal</td>
<td>42</td>
<td>52.5</td>
<td>23</td>
<td>28.8</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Hotel staff exceed expectation</td>
<td>22</td>
<td>27.5</td>
<td>39</td>
<td>48.8</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Hotel staff acquire professional skills</td>
<td>36</td>
<td>45.0</td>
<td>26</td>
<td>32.5</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Hotel staff have technical skills</td>
<td>26</td>
<td>32.5</td>
<td>33</td>
<td>41.3</td>
<td>11</td>
<td>13.8</td>
</tr>
</tbody>
</table>


In a changing global environment, the hospitality industry is being faced with the daunting tasks of keeping up with consumer demands while providing excellent customer service. Therefore, training in the area of professionalism level to ensure a seamless transition into the hospitality workplace has vital importance. Since the study is focused on the factors hindering the growth of hotel industry in the study area. It is very important to know the level of the professionalism of the staff/workers in the industry as this will have effect in the growth
and the development of the industry. The result of the analysis in the table above showed that the hotel staff always keep to their word (mean=3.54), they are loyal (mean=3.26), the staff also exceed their expectation (mean=3.00), the staff also acquire professional skills (mean=3.18) and also the hotel staff have technical skills (mean=2.94). This implies that there was high level of professionalism among the hotel workers in the study area. High level of professionalism being displayed by the hotel workers in the study area will in no doubt enhanced there service quality and thereby having positive significant effects on the growth and the development of the hotel industry in the study area. This corroborated the findings of (Kwok et al., 2012; Ruetzler et al., 2011; Tesone & Ricci, 2006) indicating that hospitality industry career success is predominantly in the areas of job competencies, job readiness, and/or perceptions of job success.

**Rate of Patronage of Respondents**

<table>
<thead>
<tr>
<th>Statement</th>
<th>SA Freq</th>
<th>SA %</th>
<th>A Freq</th>
<th>A %</th>
<th>D Freq</th>
<th>D %</th>
<th>SD Freq</th>
<th>SD %</th>
<th>Mean</th>
<th>S.deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotels should employ special workers for their services</td>
<td>27</td>
<td>33.8</td>
<td>20</td>
<td>25.0</td>
<td>27</td>
<td>33.8</td>
<td>6</td>
<td>7.5</td>
<td>2.85</td>
<td>0.98</td>
</tr>
<tr>
<td>Hotels offer facilities and other social amenities to the guests</td>
<td>13</td>
<td>16.3</td>
<td>52</td>
<td>65.0</td>
<td>10</td>
<td>12.5</td>
<td>5</td>
<td>6.3</td>
<td>2.91</td>
<td>0.73</td>
</tr>
<tr>
<td>Hotel workers are given special training for their work</td>
<td>22</td>
<td>27.5</td>
<td>41</td>
<td>51.3</td>
<td>11</td>
<td>13.8</td>
<td>6</td>
<td>7.5</td>
<td>2.99</td>
<td>0.85</td>
</tr>
<tr>
<td>The rate of staff performance/attitude towards the organizational development are of good grade</td>
<td>17</td>
<td>21.3</td>
<td>58</td>
<td>72.5</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>6.3</td>
<td>3.09</td>
<td>0.68</td>
</tr>
<tr>
<td>The rate of products and services rendered to guest are satisfied</td>
<td>30</td>
<td>37.5</td>
<td>32</td>
<td>40.0</td>
<td>10</td>
<td>12.5</td>
<td>8</td>
<td>10.0</td>
<td>3.05</td>
<td>0.95</td>
</tr>
</tbody>
</table>


The result of the analysis in the table above showed the responses from the hotels guest who patronized the sample hotels used for the study in the study area. This was done to know their opinions on what is/are needed to be done to enhance the growth of the hotel industries in the study area. The result indicated that the guest were of the opinion that hotels industries in the study area should employ special workers for their services (mean=3.54), hotels in the study area should offer facilities and other social amenities to the guests (mean=3.26), hotel workers in the study area should be given special training for their work (mean=3.00), rate of staff performance/attitude towards the organizational development are of good grade (mean=3.18) and also that products and services rendered to guest are satisfied (mean=2.94). This implies that when all these factors are put in place, it will enhance the growth of the industry in the study area.

**Managerial Factors of staff**

<table>
<thead>
<tr>
<th>Statement</th>
<th>SA Freq</th>
<th>SA %</th>
<th>A Freq</th>
<th>A %</th>
<th>D Freq</th>
<th>D %</th>
<th>SD Freq</th>
<th>SD %</th>
<th>Mean</th>
<th>S.deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The duties and responsibilities of all levels or department well spelt out</td>
<td>37</td>
<td>46.3</td>
<td>37</td>
<td>46.3</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>7.5</td>
<td>3.31</td>
<td>0.82</td>
</tr>
<tr>
<td>The company provide security and safety measures for the staff</td>
<td>25</td>
<td>31.3</td>
<td>40</td>
<td>50.0</td>
<td>15</td>
<td>18.8</td>
<td>-</td>
<td>-</td>
<td>3.13</td>
<td>0.70</td>
</tr>
<tr>
<td>Income range of staff is acceptable provision of security and safety measure for staff are adequate</td>
<td>23</td>
<td>28.8</td>
<td>36</td>
<td>45.0</td>
<td>20</td>
<td>25.0</td>
<td>1</td>
<td>1.3</td>
<td>3.01</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>26.3</td>
<td>43</td>
<td>53.8</td>
<td>10</td>
<td>12.5</td>
<td>6</td>
<td>7.5</td>
<td>2.99</td>
<td>0.83</td>
</tr>
</tbody>
</table>
The rate of hotel cooperation of the company is adequate.


The result indicated that the duties and responsibilities of all levels or department well spelt out (mean=3.31), company provide security and safety measures for the staff (mean=3.13), Income range of staff is acceptable (mean=3.00), provision of security and safety measure for staff are adequate (mean=3.18) and also rate of hotel cooperation of the company is adequate (mean=2.94). This implies that the hotel workers in the study area are well managed and this should bring about enhancement in the growth of the industry in the study area.

Results of hypotheses

Ho₁: There is no significant relationship between the professionalism level and patronage level of respondents.

Table 5: Chi-square analysis of the relationship between professionalism level and patronage level of respondents in the study area

<table>
<thead>
<tr>
<th>Variables</th>
<th>df</th>
<th>$\chi^2_{tab}$</th>
<th>$\chi^2_{cal}$</th>
<th>Sig.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professionalism level vs patronage level</td>
<td>4</td>
<td>10.012</td>
<td>78.276</td>
<td>Significant</td>
<td>Reject $H_0$</td>
</tr>
</tbody>
</table>


$p<0.05$

Results obtained from the chi-square analysis of the relationship between professionalism level and level of patronage in the study area established a positive and significant relationship between the two variables.

Ho₂: There is no significant relationship between staff professionalism and their management level.

Table 6: Result of analysis of the significant relationship between staff professionalism and their management level

<table>
<thead>
<tr>
<th>Variables</th>
<th>df</th>
<th>$\chi^2_{tab}$</th>
<th>$\chi^2_{cal}$</th>
<th>Sig.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Professionalism vs management level</td>
<td>7</td>
<td>49.152</td>
<td>148.476</td>
<td>Significant</td>
<td>Reject $H_0$</td>
</tr>
</tbody>
</table>


$p<0.05$

Table 6 presents the chi-square analysis of the relationship between staff professionalism and their management level. As contained in the table 6; there exist a positive but significant relationship between staff professionalism and their management level.

6. SUMMARY OF FINDINGS

The findings revealed that majority of the respondents were between 26-35 years of age with an average of 30.5 years, majority of the respondents 62.5% were male’s respondents. The study findings showed that majorities (70.0%) of the respondents were single. The findings of the study revealed that the majority (37.5%) of the respondents had N.C.E/O.N.D, about (30.0%) of the respondents possessed secondary school certificate and H.N.D/B.Sc respectively. Findings showed that majority of the respondents 40.0% had between 1-3 years of experience in their main occupation. In terms of religion, the findings of the study revealed that the majority (65.0%) participating respondents were Christians. The result of the analysis in the table above showed that the hotel staff always keep to their word (mean=3.54), they are loyal (mean=3.26), the staff also exceed their expectation (mean=3.00), the staff also acquire professional skills (mean=3.18) and also the hotel staff have technical skills (mean=2.94). The result indicated that the guest were of the opinion that hotels industries in the study area should employ special workers for their services (mean=3.54), hotels in the study area should offer facilities and other social amenities to the guests (mean=3.26), hotel workers in the study area should be given special training for their work (mean=3.00), rate of staff performance/attitude towards the organizational development are of good grade (mean=3.18) and also that products and services rendered to guest are satisfied (mean=2.94). The result indicated that the duties and responsibilities of all levels or department well spelt out (mean=3.31), company provide security and safety measures for the staff (mean=3.13), Income range of staff is acceptable (mean=3.00), provision of security and safety measure for staff are adequate (mean=3.18) and also rate of hotel cooperation of the company is adequate (mean=2.94).
6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion
The major focus of this study was to investigate the factors influencing the factors hindering the growth and development in hospitality industry. The findings of the study indicate that the growth and development in hospitality industry is influenced by both internal and external factors. The internal factors identified for this study include quality of effective services to the guests/customers. The external factors include finance, competition, infrastructure Liberalization of the economy either leads to retrenchment or closure of industries that minimizes the number of working class who constitute the major customers of hotels.

6.2 Recommendations
In view of the above findings and taking into consideration the fact that there is the need to be a holistic approach towards management of hotel industry in the study area and the country at large, the following recommendations are made.

The government should encourage non-financial and financial promotional programs aimed at assisting hotel industry. The government should provide an enabling business environment that is supportive, facilitative and favourable for business activities to thrive.

Hotel industry should maintain cleanliness, high quality products, and freshness in order to attract and retain customers. Addressing constraints militating against patronage effectively and regular maintenance of these facilities is a good step in the right direction to ensure profit maximization. Since training enable employee to develop and rise within the organization and increase their market value, more training and retraining programmes should be organized for hotel workers in order for them to develop their potentials in the industry. High productivity will be achieved with strategic management of hotel staff and as such hotels should manage their staff in such a way as to enhance profitability. Employers of labour and decision makers should endeavour to create enabling training environment and favorable training policies that will give every worker opportunity to attend training. Work ethics and service delivery should be given utmost priority in the hospitality industry so as to internalize such culture in the employees.

Training and development programme should be allowed to flourish through adequate funding of the programme and every employee should be given equal opportunity to benefit. The human resource departments of the hospitality industry should draw out an articulated training and development policy so as to be able to avoid the risk of losing its employee to other sectors after being sent on training. The employees in the hospitality industry should be adequately motivated through adequate, fair and commensurate reward system in line with their acquired skills. Periodic review of the programme should be carried out to ascertain the extent to which the programme have been successful with view to reviewing it where and when necessary. The infrastructural facilities in the hospitality industry should be upgraded so as to provide conducive work atmosphere for employees and customers towards greater productivity in the industry.

REFERENCES


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Tewani (2019). Factors that influence hospitality industry.


EXAMINING EMOTIONAL EXHAUSTION, JOB STRESS AND BURN OUT OF FOOD AND BEVERAGE DEPARTMENT EMPLOYEE

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ABSTRACT

This research work was carried out to examine emotional exhaustion, job stress and burn out amongst hotel food and beverage department employees in five selected hotels in Lagos state. For developing an overview in this area, questionnaires were distributed to 44 food and beverage employees, and the effective response (39) rate was 88.6%. The findings showed the major causes of emotional exhaustion, job stress and burn out were due to multitasking of employees. The stressor during working hours include nagging boss, complicated guest, work overload, sexual harassment, long working hour and low income as reported by the respondents. The study identified the problems faced in the study area and also recommended the ways of moderation through motivations, creation of enabling environment, training, recruitment of more hands and increment of salary.

Keywords: Burn out, Emotional exhaustion, Employees, Food and beverage, Job stress

1. INTRODUCTION

The hospitality industry is one of the world’s largest labour industry. The hotel food and beverage department consists of both the service employees as well as kitchen employees. It is pertinent for all employees of the department to willingly cooperate and coordinate in carrying out activities as this is necessary for smooth and efficient operation of the establishment. Broadly speaking, periods of intense activity and the necessity of pleasing the customers are inherent in the food and beverage department. Employees are therefore faced with heightened exhaustion due to stressful and demanding situations which invariably lead to burnout.

Emotional exhaustion consist of a feeling of not being able to give any more emotionally to the job because the employee has nothing more to give (Maslach & Goldberg, 2009; Maslach et al. 2008). It is characterized by lack of energy and a feeling that emotional resources are used up (Bakker et al. 2013). This may co-exist with feelings of frustration and tension, some think that emotional exhaustion is feeling of being emotional over - extended and drained by ones contact with other people. This emotional exhaustion can manifest itself in physical characteristics such as waking up just as tired as when going to bed or lacking required energy to take on another task or face-to-face encounter. Emotional exhaustion was found to be a strong predictor of both walk engagement and turn over intentions. When individual experience higher level of emotional exhaustion, they are more likely to leave their jobs and positive correlation have also been found between emotional exhaustion and turn over intention (Maslach et al., 2014).

Job Stress is due to the periods of intense activity and the necessity of pleasing the customers on whose gratuities their livelihoods often depend, many of the workers in this industry are subject to high levels of job stress. Many of the activities of food and beverage employees, particularly those in kitchens are carried out in stressful environments featuring high heat and humidity, poor ventilation, poor lighting and noise. Likewise, the restaurant dining room can be a very high stress environment because of the pressure of performing efficiently while working within tight schedules, working shifts, dealing with irate and difficult customers. Other physical stressors such as noise and poor air quality can also be experienced in the restaurant environment.

Stress emerges when the pressure owned by a person are out of the individual ability to cope (Difate, 2008). when there is lot of conflicting roles need to fulfill by an employee, when the real job task differ from the role expectations, when the employee need to accomplish too much task and the resources that is provided is not enough to fulfill the task, work stress will occur (freeman & coll, 2017). Burn out cause by stressful working life and it is a chronic emotional reaction. Burn out reduces a person’s personal achievement, emotional exhaustion and depersonalization.

Stressed situations stemming from inter-personal relationships in work place, from the job itself or working conditions can be a negative factor for food and beverage employees in other service fields. “Stress experienced in hospitality businesses is related to physiological symptoms, headache, digestion problems, ulcer, hypertension, heart attack, and stroke of employees, and results caused by these problems decrease production and increase health spending of employees” (O’Neill & Davis, 2011). Stress faced by hotel employees is vital because these stressed situations can end with burnout in employees.
“Burnout concept was used for the first time by Freudenberger in 1974. Freudenberger defined burnout as alienation, depression, anxiety, loss of idealism, loss of soul, and a response mechanism for coping with the work and stress.

Farber indicated burnout as a result of stressed working conditions rather than a coping mechanism”(Söderfeldt, et al., 1995). Burnout is a chronic and emotional response to highly excessive demands, specifically for the well-being of other persons or directed for the distress and conflicts resulting from responsibility and interaction for success (Warr, 2002).

Burnout has been constantly linked with physiological and affective outcomes (Burke & Greenglass, 1995; Cherniss, 1992; Lee & Ashforth, 1993; Maslach & Leiter, 1998;), as well as with organizational consequences such as increased turnover, increased intention to leave, negative work attitudes, and reduced levels of performance (Cameron, et al., 1994; Jackson, et al., 1986; Lee & Ashforth, 1996; Wolpin, et al., 1991; Wright & Bonett, 1997; Wright & Crobpanzano, 1998; Brotheridge & Grandey, 2002). Therefore, it is important to extend the research ability to predict burnout. In Maslach’s original framework, the burnout syndrome indicates three distinct states. The first component, emotional exhaustion- employees feel emotionally—spent, which is a chronic state of emotional and physical depletion.

Demerouti, et al., (2001) suggested: Emotional exhaustion closely resembles traditional stress reactions that are studied in occupational stress research, such as fatigue, job-related depression, psychosomatic complaints, and anxiety. As a result, it is reasonable to conceptualize emotional exhaustion as a type of strain that results from workplace stressors. The second component, depersonalization - display a detached attitude toward others, which is a type of interpersonal distancing and lack of connectedness with one’s coworkers and clients. The third component, diminished personal accomplishment - extend the research ability to predict burnout. In Maslach’s original framework, emotional exhaustion exhibits stronger relationships than other important outcome variables (Lee &Ashforth, 1993, 1996; Wright & Bonett, 1997).From the Empirical aspect, some research has showed that, compare with other components, emotional exhaustion exhibits stronger relationships than other important outcome variables (Lee &Ashforth, 1993, 1996; Wright & Bonett, 1997).From the conceptual aspect, Shirom (1989) noted that emotional exhaustion could be the best reprehensive of the core meaning of burnout (Pines & Aronson, 1988).

Through these empirical findings and conceptual frameworks, this study tends to examine relationship of emotional exhaustion, job stress and burnout of hotel, food and beverage employees.

2. METHODOLOGY

The study was carried out in Lagos, specifically Ikeja local government area, the capital of Lagos state, the centre of excellence. Lagos state was chosen as the area of study because it is highly populated and known to be a center for business attraction which attracts business people and tourist which contributes to high hotel patronage by guest. The hotel understudied include: Apartment Royale hotel and suites, Shoregate Hotels, Presken Hotels, Water Cress Hotels and Posh Apartment Metro. These hotels were chosen due to the peculiarity of their location — their closeness to the airport, and industries.

Data Collection and Analysis

The population for this study comprises of all entire employee of the food and beverages departments of all the five selected hotels. Structured questionnaires were distributed 44 copies, and the effective response (39) rate was 88.6%. The data for this research study was collected using structured questionnaire drafted by the researcher. The information contained in the questionnaire was not limited to socio-demographic information of the respondents and information on exhaustion and job stress. Analysis of the research study was carried out using descriptive statistics technique. The descriptive part of the analysis comprises of frequency, percentage and pictorial representation. Frequency and percentage analysis was adopted for the socio-demographic information of the respondents while responses on emotional exhaustion, job stress, burn out of hotel food and beverage employees were analyze using frequency, percentage and charts for diagrammatic representation. Chi-Square Test of Significance was adopted to confirm performance of validity.

3. RESULTS AND DISCUSSION

Table I: Frequency and Percentage Distribution of Respondents Socio-Demographic Characteristics

<table>
<thead>
<tr>
<th>S/N</th>
<th>ITEMS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>23</td>
<td>59</td>
</tr>
<tr>
<td>1</td>
<td>Female</td>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>39</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>single</td>
<td>24</td>
<td>61.5</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>15</td>
<td>38.5</td>
</tr>
<tr>
<td>Age group</td>
<td>21-30 year</td>
<td>31-40year</td>
<td>41- and above</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
<td>-----------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>20.5</td>
<td>43.6</td>
<td>35.9</td>
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<table>
<thead>
<tr>
<th>Educational status</th>
<th>SSCE/GCE</th>
<th>OND/NCE</th>
<th>HND/BSC</th>
<th>Others</th>
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<tbody>
<tr>
<td></td>
<td>3</td>
<td>10</td>
<td>24</td>
<td>2</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>7.7</td>
<td>25.6</td>
<td>61.5</td>
<td>5.1</td>
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<table>
<thead>
<tr>
<th>Length of service</th>
<th>1-5years</th>
<th>6-10years</th>
<th>11-15years</th>
<th>16-20years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19</td>
<td>15</td>
<td>4</td>
<td>1</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>48.7</td>
<td>38.5</td>
<td>10.3</td>
<td>2.6</td>
<td>100</td>
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</table>

<table>
<thead>
<tr>
<th>Religion</th>
<th>Christian</th>
<th>Muslim</th>
<th>Traditional</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27</td>
<td>11</td>
<td>1</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>69.2</td>
<td>28.2</td>
<td>2.6</td>
<td>100</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Income</th>
<th>16,000-25,000</th>
<th>25,000 and above</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>36</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>7.7</td>
<td>92.3</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Department</th>
<th>Kitchen</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>43.6</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job Status</th>
<th>Floor Worker</th>
<th>Junior Employees</th>
<th>Total</th>
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</thead>
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<td></td>
<td>1</td>
<td>21</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>2.6</td>
<td>53.8</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proximity of residence and work</th>
<th>Far</th>
<th>Very Far</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19</td>
<td>2</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>48.7</td>
<td>5.1</td>
<td>100</td>
</tr>
</tbody>
</table>
Table I depicts the frequency and percentage analysis of respondents socio-demographic information. It can be seen that male are more than female as they constitute 51% of the total sample while the female constitute 41% respectively, this indicates the male are more than the female in the hotel all because they are more hardworking than female.

Item 2 indicates the marital status of the respondents. It can be seen that 61.5% of them are single while 38.5% are married; this indicates that the majority are single in the restaurant and kitchen section because they are strong and have the ability to withstand stress than the married. On the age distribution, as evidenced in item 3, analysis revealed that 20.5% of the respondents were between age 21-30 years, 43.6% were within 31-40 years while 35.9% were between 41-and above respectively, this indicates that the employees are still in their prime age, therefore they can carry out their daily activities effectively, most especially where there are more hands.

Also, educational status of the respondents in item 4 showed that majority of the respondents are HND/B.Sc holders which constitute 61.5% of the total sample with SSCE/GCE holders constituting the minor of 7.7%. This indicates that the food and beverage department is filled with professionals because the undergraduates tend not to have the full knowledge of service and coping with stressors.

Taking the length of service into consideration, majority of the respondents (48.7%) have worked between 1-5 years while few of respondents constitute 2.6% have worked between 16-20 years while others have worked 6-15 years respectively. This indicates that most of the employees are not really experienced and coping with stress may seem to be difficult.

Religion of respondents indicates that majority of the respondents are Christian (69.2%) while the Muslim and traditional religion constitute 28.2% and 2.6% respectively. It indicates that the employees are religious.

On the monthly income of respondents’ in item 7, majority of respondents constituting 92.3% earn 25,000 and above. The respondents work at both restaurant and kitchen. This indicates that the employees are been paid averagely high, to boast their working ability.

Although, restaurant workers constitute about 56.4% while kitchen workers constitute 43.6% as depicted in item 8. this indicates that there are more hands in the restaurant than the kitchen because the restaurant employees serve directly to the guest, more hands are usually needed for accuracy in service and they assists the kitchen in presenting their products.

Item 9 shows the job status of the respondents. Analysis indicated that 2.6% of the respondents are floor worker, 53.8% are junior employees while 43.6% are senior employees. This implies that majority of the respondents are junior employees and they have majority of the burden for customer satisfaction to thrive.

From item 10 of the table, proximity of residence and work indicates that 7.7% of respondents live very close, 38.5% respondents do not live very close, 48.7% respondents live far while 5.1% of respondents live very far. This shows that majority of them live far away from their workplace.

Table II: Frequency and Percentage Analysis of Respondents Perception to Stress and Emotional Exhaustion

<table>
<thead>
<tr>
<th>S/N</th>
<th>ITEMS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Restaurant and kitchen activities are stressful</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>U</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SA</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D</td>
<td>14</td>
</tr>
<tr>
<td>12</td>
<td>Long working hours and family time is easily matched together</td>
<td>U</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SA</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>39</td>
</tr>
</tbody>
</table>
Table II depicts the frequency and percentage distribution analysis of respondents' perception to stress and emotional exhaustion. From item 11, the respondents strongly and agreed that restaurant and kitchen activities are stressful (76.9% and 17.9%), but disagreed that long working hours and family time is easily matched together as evidenced from 56.4% of the total respondents in item 2. From item 3, respondents also strongly disagreed and disagreed (54%) that the monthly income suits the daily stress as 30.8% of them opined that carrying out more than a person's duties are conveniently done. Analysis of the table can be evidenced from pictorial representation of figure 1 respectively.

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>U</th>
<th>A</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>7</td>
<td>18</td>
<td>8</td>
<td>6</td>
<td>39</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td>3</td>
<td>9</td>
<td>39</td>
</tr>
</tbody>
</table>

**The monthly income suits the daily stress**

**carrying out more than a person's duties are conveniently done**

**Figure 1:** Multiple Bar chart showing perception of respondents to Stress and Emotional Exhaustion
Table III: Frequency and Percentage Distribution of Respondents Stressors

<table>
<thead>
<tr>
<th>S/N</th>
<th>ITEMS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>12</td>
<td>30.8</td>
</tr>
<tr>
<td>15a</td>
<td>Nagging Boss</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>15</td>
<td>38.5</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>12</td>
<td>30.8</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>22</td>
<td>56.4</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>15</td>
<td>38.5</td>
</tr>
<tr>
<td></td>
<td>Very often</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>15b</td>
<td>Complicated Guest</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>11</td>
<td>28.2</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>15</td>
<td>38.5</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>22</td>
<td>56.4</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>15</td>
<td>38.5</td>
</tr>
<tr>
<td></td>
<td>Very often</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td>15c</td>
<td>Work Overload</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>27</td>
<td>69.2</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>8</td>
<td>20.5</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>23</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Very often</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>8</td>
<td>20.5</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Very often</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>15d</td>
<td>Sexual Harassment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>13</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Very often</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>8</td>
<td>20.5</td>
</tr>
<tr>
<td>15e</td>
<td>Long Working Hour</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>13</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>17</td>
<td>43.6</td>
</tr>
<tr>
<td></td>
<td>Very often</td>
<td>7</td>
<td>17.9</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>11</td>
<td>28.2</td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>9</td>
<td>23.1</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Very often</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table III indicates the responses of participants on their stressors. Item 15a showed that their nagging boss do not contribute to their stress (30.8%), 38.5% respondents agreed it is occasional; while 30.8% of respondents reported their nagging boss often contribute to their stress.

Item 15b indicates that 56.4% which indicates majority opined that complicated guests occasionally contribute to their stress, 38.5% respondents confirm it is often while 5.1% respondents agreed it is very often.

Work overload also confirmed it that it contribute mostly to the respondents stress as majority of them (59%) agreed it is often as depicted in item 15c.

Few of the respondents (20.5%) opined that sexual harassment is a stressor to them because it occasionally happened but 69.2% of the respondents said sexual harassment has never been a stressor to them as analysed in table 15d.

However, item 15e indicates that long working hour of the respondents is often a stressor to them as they will have to meet up customers and organization target. Also, low income of the respondents was also evident that it often (41%) stress them the more. This inferred that worker taking low income and multitasking will be stressed out since she/he will have it in mind that the work done is more than the pay received. Pictorial representation of the analyses item can be evidenced in figure 2.
Figure II: Multiple Bar chart showing perception of respondents to job stressors

Table IV: Frequency and Percentage Distribution of Respondents’ experience during High Customer turnover/Patronage period

<table>
<thead>
<tr>
<th>S/N</th>
<th>ITEMS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>16a</td>
<td>Job stress</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>22</td>
<td>56.4</td>
</tr>
<tr>
<td></td>
<td>Very often</td>
<td>7</td>
<td>17.9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>39</td>
<td>100</td>
</tr>
<tr>
<td>16b</td>
<td>Burn out</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>8</td>
<td>20.5</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>15</td>
<td>38.5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>39</td>
<td>100</td>
</tr>
<tr>
<td>16c</td>
<td>Emotional exhaustion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>7</td>
<td>17.9</td>
</tr>
<tr>
<td></td>
<td>Very often</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>39</td>
<td>100</td>
</tr>
</tbody>
</table>
From table IV, majority of the respondents (56.4%) often experience job stress, 38.5% of respondents confirmed they occasionally experience burn out while 41% opined that they never experience emotional exhaustion. This implies that majority of the respondents experience job stress, burnout and emotional exhaustion either occasionally, often, and very often. Pictorial representation of the presented table can be evidenced in figure 3.

![Multiple Bar chart showing experience of respondents during High Customer Turnover/Patronage](image)

**Figure III:** Multiple Bar chart showing experience of respondents during High Customer Turnover/Patronage

**Table V:** Frequency and Percentage Distribution of Respondents ratings on working ability during customer high patronage

<table>
<thead>
<tr>
<th>S/N</th>
<th>ITEMS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>How will you rate your working ability during customer high patronage</td>
<td>Not efficient 2 5.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fairly efficient 10 25.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Efficient 18 46.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>very efficient 9 23.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

On ratings of working ability during customer high patronage, table v shows that about 5.1% of the respondents agreed that their working ability is not efficient, 25.6% of respondents agreed it is fairly efficient, 46.2% respondents agreed it is efficient while 23.1% of the respondents confirmed it is very efficient. This implies that majority of the respondents working ability is efficient during customer patronage.
### Table VI: Frequency and Percentage Distribution of Respondents on query given by their employer

<table>
<thead>
<tr>
<th>S/N</th>
<th>ITEMS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>18a</td>
<td>Lateness to work</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>19</td>
<td>48.7</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>17</td>
<td>43.6</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>18b</td>
<td>Lack of time management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>20</td>
<td>51.3</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>18c</td>
<td>Customer dissatisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>13</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

On the responses obtained from different category of query given to the respondents, it shows that 48.7% of respondents have never been given any query due to lateness to work, 51.2% have never been given due to lack of time management but, 41% of respondents have been given query occasionally due to customer dissatisfaction. Few of the respondents have been queried as a result of lateness to work and lack of time management as evidenced from the pictorial representation of figure 4.
Table VII: Frequency and Percentage Distribution of respondents’ perception to Multi-tasking

<table>
<thead>
<tr>
<th>S/N</th>
<th>ITEMS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Extent of multitask (doing more than one person’s job)</td>
<td>Not at all</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Occasionally</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Often</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very often</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>20</td>
<td>How often are you rewarded for multi-tasking?</td>
<td>Not at all</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Occasionally</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Often</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very often</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>21</td>
<td>How often do you find it easy</td>
<td>Often</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very often</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

On the perception of respondents to multi-tasking, item 19 shows that 5.1% of respondents do not multitask, 23.1% respondents are occasionally multitask, 51.3% of respondents are often multitask and 20.5% respondents were multitasked very often. This implies that majority of the respondents multitask. However, majority of them said they been rewarded occasionally for the work down as a result of the multitasking but also occasionally find it easy. The pictorial representation of the analyses item can also be evidenced in figure 5 below.
Table VIII: Frequency and Percentage Distribution of Respondents' multitasking category and health challenges

<table>
<thead>
<tr>
<th>S/N</th>
<th>ITEMS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tick your category of multi-tasking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>2 persons job for 1 person</td>
<td>21</td>
<td>53.9</td>
</tr>
<tr>
<td></td>
<td>3 person job for 1 person</td>
<td>13</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>2 person job for 2 person</td>
<td>5</td>
<td>12.8</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td>Do you have any health challenge?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>No</td>
<td>27</td>
<td>69.2</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td>Is your organization aware of this?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>No</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
<td><strong>30.8</strong></td>
</tr>
<tr>
<td></td>
<td>Missing System</td>
<td>27</td>
<td>69.3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Item 22 of table VIII indicates that only 12.8% of the respondents did not multitask, 53.9% which indicates the majority of the respondents do two (2) persons job for one (1) person, while 33.3% of respondents do three (3) persons job for one (1) person.

On whether the respondents have any health challenges, item 23 showed that 30.8% of the respondents health challenges while 69.2% do not. About 25.6% of respondents with health challenges reported that their organization did not know about it while 5.1% of respondents reported their health challenges.

Table IX: Frequency and percentage distribution of Respondents’ taking care of employees’ well-being and promotion of quality of work

<table>
<thead>
<tr>
<th>S/N</th>
<th>ITEMS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>24</td>
<td>61.5</td>
</tr>
<tr>
<td></td>
<td>SA</td>
<td>14</td>
<td>35.9</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td>U</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>25</td>
<td>64.1</td>
</tr>
<tr>
<td></td>
<td>SA</td>
<td>12</td>
<td>30.8</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>U</td>
<td>4</td>
<td>10.3</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>24</td>
<td>61.5</td>
</tr>
</tbody>
</table>
From table ix, analysis shows that majority of the respondents (97.4%) opined that regular training will be of help in moderating influence of coping behaviour and control of stress outcomes, while 2.6% were neutral. On the response of motivation of employees in item 26, 64.1% agreed, 30.8% strongly agreed and 5.1% of them were neutral. This shows that majority of the respondents were of the opinion that employees in the respective organization should be motivated to reduce stress and promote their quality of work life. Respondents also opined in item 27 that technology should be used to improve operational skills of employees (87.2%) and a friendlier atmosphere in work place should be encouraged as agreed and strongly agreed by 83.6% of the total respondents. Pictorial representation of the analysed item can be evidenced in figure 6 below.

![Figure VI: Multiple Bar chart showing responses on promotion methods of employees well-being and quality of life](image)

4. HYPOTHESES TESTING

Chi-Square Test of Significance was adopted to confirm if job stress, emotional exhaustion and burn out have effect on employee performance.

Decision Rule: Reject $H_0$ if $P$-value < $\alpha$ 0.05 level of significance. Otherwise, fail to reject $H_0$

**Hypothesis One**

$H_0$: Job Stress does not have significant effect on employee performance

$H_1$: Job Stress has significant effect on employee performance

**Table X:** Chi-Square Tests (Job Stress and Staff Performance)
Hypothesis Two

$H_0$: Emotional Exhaustion does not have significant effect on employee performance

$H_1$: Emotional exhaustion has significant effect on employee performance

Table XI: Chi-Square Tests (Emotional Exhaustion and Staff Performance)

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>25.323$^a$</td>
<td>9</td>
<td>.003</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>23.957</td>
<td>9</td>
<td>.004</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>2.572</td>
<td>1</td>
<td>.109</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 14 cells (87.5%) have expected count less than 5. The minimum expected count is .10.

Pearson Chi-square test statistic of 25.323 with df 9 and associated P-value 0.003 indicates the rejection of null hypothesis. We therefore conclude that emotional exhaustion has significant effect on employee performance.

Hypothesis Three

$H_0$: Burn out does not have significant effect on employee performance

$H_1$: Burn out has significant effect on employee performance

Chi-Square Tests (Burn out and Staff Performance)

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>13.334$^a$</td>
<td>9</td>
<td>.148</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>17.948</td>
<td>9</td>
<td>.036</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.005</td>
<td>1</td>
<td>.946</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 14 cells (87.5%) have expected count less than 5. The minimum expected count is .26.

Significance test of burn out and employee performance indicates from the chi-square test statistic of 13.334 (df=9) and associated P-value of 0.148 indicates that burn out of employee does not have enough effect on performance.
5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Empirical analysis of the research study indicated that the major causes of emotional exhausting, job stress and burn out in the hotel food and beverage were due to multitasking of the employees that is carrying out more than one person’s duties. This was as a result of deficiency in employees’ recruitment.

In addition, analysis indicated that major stressors during working hours in the hospitality industry were nagging boss, complicated guests, work overload, sexual harassment, long working hour and low income as reported by the respondents.

Empirical analysis of the research study also indicated that job stress and exhaustion can be managed through motivation, creation of enabling environment and training. Also, increment in salary and recruitment of more hands for better productivity

5.2 Recommendations

Based on the study carried out, emotional exhaustion, job stress and burn out in food and beverage department can be moderated by

i. Recruiting more hand to avoid multi tasking

ii. Increment in employees salary to boast employees moral and ability to work

iii. Training employees to cope during customer high patronage or turnover

iv. Motivating employees by creating a friendlier atmosphere.

REFERENCE


1st National Conference of WITED, Ilaro Chapter


SOCIOPRAGMATIC STUDY OF GENDER AND LANGUAGE USE IN AMA ATA AIDOOS CHANGES AND CHIMAMANDASS HALF OF A YELLOW SUN

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ABSTRACT
Sociolinguistics is concerned with language use in social and cultural context and focuses on how we use language to accomplish acts in our different settings. Women and men speeches reflect their roles in the society, also the kind of relationships they keep with their interlocutors had a great influence on their choice of words. This study investigated a socio-pragmatic gender and language use of men and women in Ama Ata Aidoos Changes and Chimamandass Half of a Yellow Sun. The study adopted a descriptive research design method. This study examined the differences in use of language between women and men from the aspects of predominant speech acts, mood type, language features and context in the selected texts. The study made use of two Nigerian Literary texts: Ama Ata Aidoos Changes and Chimamanda Adichies Half of a Yellow Sun and samples were purposively selected from the texts which were solely on mix-sex dialogues. Few dialogues were randomly selected from both texts and were analyzed. Excerpts were presented in a table that differentiated the male from the female utterances. Findings revealed that male interlocutors used more of indicatives and interrogatives than the female interlocutors in the selected texts while women used more of directives and a little more of assertive languages in expressing indirect statements. It was concluded that the nature of the mood type employed by men and women in the selected texts was more of indicative and declaratives.

Keywords: Gender, interlocutors, language use, mood, socio-pragmatic, speech act

1. INTRODUCTION
A critical distinction between human beings and animals is to a large extent, the way we communicate with one another. Human beings use words to express emotions, thoughts and information of any kind. In each language use, words are constructed in a particular way and it is inspiring to know that when studying, written or verbal words, it is quite possible to ascertain whether a word belongs to a gender or another even when the person has no clue about the sex of the one communicating. Gender has been defined by various authors and the entire definition is summed up in three options: by sex we mean a social variable with two values namely female and male; secondly, gender is the social differentiation of individuals within a continuum between feminine and masculine and thirdly, gender is the negotiable and contestable classification of individuals into categories of female and male based on cultural understanding of the body, especially with respect to sexuality (Nobelius, 2004).

Language according to Osisanwo (2008:1) is human vocal noise or the arbitrary graphic representation of this noise, used systematically and conventionally by members of a speech community for purposes of communication. It is important to know that language is a human attribute, it has a graphic representation which is in form of text, used in different ways by individuals of a society to communicate their feelings, intentions, fears, ideas, anger and roles in different context. Sociolinguistics is concerned with language use in social and cultural context and it focuses on how we use language to accomplish acts like, apologies, declarations, request and commands in our different settings. Speech Act is a theory propounded by Austin (1962) and Searle (1975) who believe that human cannot account for the use and meaning of language in the absence of context because it is vital and necessary.

Different scholars have recognized and taken interest in the language use and creative prowess of Ama Ata Aidoos Changes and Chimamandas Half of a Yellow Sun. However, most of the studies available on these literary texts are mostly on theme, creative processes and aesthetics. Little attention is given to linguistic studies like socio-pragmatic investigation of the language difference of genders and how it relates to context. However, this study is focused on the socio-pragmatic features of gender language differences as it relates to context in the
selected texts. Two gender based texts have been selected as the data for this study, both by female authors; *Changes* by Ama Ata Aidoo and *Half of a Yellow Sun* by Chimamanda Adichie. The choice of texts arose from the need to a thorough and unbiased study on issues around gender language differences (language features of men and women) reason being that only a detailed analysis would enable useful understanding of this study.

This study investigated different language features of the interlocutors, contexts, speech acts and mood types of opposite sex characters in the selected texts. Hence, there arose the question of do women in all contexts truly reflect powerless language as opposed to their male counterpart? The study adopted insights from Wardhaugh's theory of difference in the language differences of genders. It also investigated the gender language differences in *Changes* by Ama Ata Aidoo and *Half of a Yellow Sun* by Chimamanda N. Adichie while the specific objectives were to: examine the influence of context on the language use of men and women; investigate the predominant gender language features employed by men; examine the language features of women within their sub-cultural settings in the selected texts and to investigate the predominant mood type and speech act implored by men and women in the selected texts.

2. LITERATURE REVIEW

The theoretical framework for this study is Searle and Austines Speech acts theory. Speech act focuses on language use in a particular context. This theory explains the role of utterances in shaping the attitudes of the individuals in different forms of interpersonal communication which has to do with the actual intention of the speaker and the effect it has on the hearer. According to Austine (1962) and Searle (1975), in every utterance (Speech Act), the actions of promising, requesting, predicting, confirming and assuring are performed. This study also adopted Hallidays theory of Mood Structure, which is an aspect of Systemic Functional Grammar. Mood is a system through which interpersonal meanings are realized within an exchange. Eggins (2004) posits that language involves interactions where we initiate or respond to the act of giving or demanding for goods and services or information. Therefore, Halliday and Mathiesessen (2004) regard this function of giving or demanding for goods and services or information as one of exchange. Within mood is a choice between imperative and indicative. If indicative is chosen, there is a choice between declarative and interrogative and if imperative, there is a choice between jussive and non-jussive.

Gender and language have become an interesting topic which linguists have investigated over time. Early study in linguistic anthropology (Coates, 1988; Fishman, 1980; Lakoff, 1975 & Zimmerman, 1975) and many others looked at the differences between women’s and men’s speeches across languages to identify distinct female and male language features. Focusing on the feelings by Lakoff (1975), among speakers from similar social class; women tend to use standard and formal language forms which are characterized by, intensifiers, hedges, tag question sentences, minimal responses, exclamation remarks, polite expressions and indirect expressions. While men use more of vernacular, taboo words, proverbs, command expressions, interruptions, strategic language in order to control conversations and less minimal responses to mention but a few. Lakoff (1975) in his book *Language and Women’s place* concludes that women’s language is inferior while men’s language is superior. According to the findings, the difference in men and women’s language features reflects a power imbalance between sexes. However, according to Lakoff (1975) there are different views on why men and women possess different language features. To him, women belong to the minority group which is oppressed and marginalized and women belong to different subcultures, and their differing conversational styles reflect these subcultures, hence, women’s language is weak, hesitance and lack confidence.

As a result, womens language features present women as powerless, incapable of holding power and of presenting their point of view forcefully. Holmes (1992) posits that the aim of sociolinguistics is to move towards a theory which provides a motivated account of the way language is used in a community and of the choices people make when they use language. Jinyu (2014) states that the main content of sociolinguistics is the study of the relationships between language and society that is; it majors on the study of language structure and social context. Bucholtz (1999) in his own view emphasized that what is needed in the study of the differences in gender language is a form of analysis which is less focused on the individual woman or man and trends of speech in the society as a whole, but more focused on the way context and individual mutually shape the manner in which the interaction takes place.
Wahyuningsih (2018) in his study on Men and women differences in using language: A case study of students at Stain Kudus, concluded that male and female students have shown their differences in their forms, contents and uses. Hence, men tend to be more directive. Besides, they use more simple words. On the other hand, women are more expressive and polite in using language. In addition, they use more gestures and words signifying the feeling, emotional and psychological states. Gender differences in language phenomenon are not accidental; they have the profound social root. Gender differences including language are the fundamental facts of social life and human differences. It reflects a long historical origin in language difference phenomenon. Men and women have different status and play different roles, thus they have different duty rights. Researchers engaged in sociolinguistics explained different phenomenon of gender language differences from the perspective of social structure, consistency and rights. They think the formation of language difference is due to the unequal status of males and females. For one thousand years, the traditional concept of men outside, women inside has dominated people, and men are seen as dominators of status and power. They govern the external world and go out to earn money for the family, women were considered to be weak and only do activities in the family. The three obediences and four virtues of ancient China more exactly reflects their humble social status. A womans duty is to serve her husband, children, take care of her parents-in-law, and do house work. A woman is almost unable to take part in social activities. (Jinyu, 2014). This study therefore, investigated the differences in gender language use of interlocutors as it relates to context in the selected text – Ama Ata Aidoos’ Changes and Chimamandas Half of a Yellow Sun.

2.1 Gender and Language Differences
Not only has gender distribution affected the whole event which happens in the society, it has altered the way men and women use language. There are various theories relevant to gender differences in language use. Ralph in his 1990 book titled: The Sociolinguistics of Language examined the influence of social interaction on language use. He also examined the theory of sociolinguistics gender pattern as a tool to illuminate the existing linkage between gender relations in a particular society and suggested different gender frameworks (Ralph, 1990).

Hash (1981) states that there are some differences between men and women in expressive and declaratives. Women pay more attention to the love feelings. Expressive and declarative speech acts create some rules and standards that people use to judge their own feelings or others. Hawkar (2016) studied Gender differences in using language in the EFL classes: From teachers views, posits that there are some factors that cause gender differences. The most significant factors related to students psychological conditions, the students cultural and social backgrounds, and students connection to the native speakers, the students physical characteristics, and materials that are taught by the teachers.

Okata (2016) in her study on Turn-taking sequence discourse: A tool to effective conversation in a related speech of interlocutors” opined that proper Turn-taking sequencing in a discourse is a tool to effective communication in a related speech of interlocutors. There is no particular universally accepted definition of sociolinguistics known to human but sociolinguistics is seen by all scholars as the study of the relationship between language and society. Holmes (2011) believes that sociolinguistics helps us understand why we speak differently in various social contexts, and help uncover the social relationships in a community. Pragmatics is the study of language from a functional perspective, that is, it attempts to explain facets of linguistic structure by reference to non-linguistic causes (Levinson, 1983). Hence, socio-pragmatics investigates the social perceptions underlying participants’ performance and interpretation of linguistic action (Leech, 2008).

2.2 Speech Acts
Mey (2001) posits that speech Acts are verbal actions happening in the world. He adds that by uttering a speech one performs an act with his words. Korta and Perry (2006) assert that Austine realized some problems with his distinction which made him replace the constantive, performative elements with a threefold distinction which are locutions, illocutions and perlocutions.

- **Locutionary Act**: it is the actual words uttered (Thomas, 1995). To him, to produce a meaningful linguistic expression is to perform illocutionary act.
- **Illocutionary Act**: this is the actual intention of the speaker as perceived by the hearer.
- Perlocutionary act: the effect that the locutionary act has on the hearer (i.e. the reaction) is referred to as perlocutionary act.

Searle’s contribution made speech acts to adopt a social view of linguistic meaning by making it a theory of constitutive rules for performing illocutionary acts (Korta & Perry, 2006). He focused more on the illocutionary acts classification. The classifications are:

1. Assertives: these are used to express beliefs. They are statements of facts, conclusions, etc.
2. Directives: these are used by speakers to get someone else to do something. They are commands, orders, requests, etc.
3. Commissives: they are used to commit the speaker to some future actions. They are promises, pledges, threats, etc.
4. Expressives: feelings of speakers are stated with expressive i.e. the psychological states of speakers. They can be statements of displeasure, joy, etc.
5. Declaratives: they reflect the institutional role of a speaker. They change the world via their utterances.

2.3 Mood System

The mood system is one of the propositions of functional systemic linguistics (i.e. the interpersonal metafunction of Language), which we have adopted for the present study. It facilitates our ability to account for the various options that are available to the speaker in the use of language (Osisanwo, 2003). According to Alo (1998), the sentence, for example, may be used to approve or disapprove, to express doubt, to ask questions or give answers; to greet, instruct, or to command others; to include others within the social group or to exclude others from it. These various uses or functions of the sentence correspond to grammatical categories which are called declarative (statement sentence): imperative (commands, requests) and exclamatory (exclamation).

3. METHODOLOGY

The study made use of two Nigerian Literary texts: Ama Ata Aidoo’s Changes and Chimamanda Adichie’s Half of a Yellow Sun. Samples were purposively selected from the texts which were solely on mix-sex dialogues. Few dialogues were randomly selected from both texts and were analyzed. Excerpts were presented in a table that differentiates the male from the female utterances.

The study employed descriptive research method to investigate the language choices of interlocutors and the context that determines their language use. The main task of analysis for this study, therefore, is to find out the predominant speech act, mood type and language features of men and women and the determining contexts in the selected texts. To realize these objectives, dialogues between men and women were extracted from the selected literary texts.

Selected dialogues from the texts were analyzed using the speech acts and mood structure to identify the prevalent gender language feature of male and female and the context use. This is viewed from sociolinguistics and pragmatics perspectives. As mentioned earlier in this study, to ascertain if men use superior language while women use inferior language; the gender language features of men and women were identified in the course of the analysis. Speech acts, mood type and language features were analyzed on different tables to reveal the predominant speech act, mood type, and language features of male and female in the selected texts.

3.1 Data Analysis and Presentation

Analysis of changes by Ama Ata Aidoo and Half of a Yellow Sun by Chimamanda Adichie.

Table 1: Mood Features

<table>
<thead>
<tr>
<th>MALE</th>
<th>INDD</th>
<th>INDIN</th>
<th>IMP</th>
<th>FEMALE</th>
<th>INDD</th>
<th>INDIN</th>
<th>IMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialogue</td>
<td>42</td>
<td>33</td>
<td>6</td>
<td>1</td>
<td>50</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>1</td>
<td>61</td>
<td>22</td>
<td>-</td>
<td>2</td>
<td>53</td>
<td>28</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
<td>55</td>
<td>6</td>
<td>Total</td>
<td>103</td>
<td>44</td>
<td>10</td>
</tr>
</tbody>
</table>

Key: INDD = Indicative declarative
INDIN = Indicative interrogative
IMP = Imperative
D = Dialogue

Table 2: Speech Act Features

| Dialogue | MALE | | | | | | FEMALE | | | | |
|----------|------| | | | | | | | | | | |
|          | A | D | DC | E | C |          | A | D | DC | E | C | |
| 1        | 34 | 32 | 3  | 5  | 1 | 1        | 42 | 17 | 3  | 8  | 4 | |
| 2        | 39 | 29 | 2  | 3  | 4 | 2        | 41 | 32 | 4  | -  | 2 | |
| TOTAL    | 73 | 61 | 5  | 8  | 5 | Total    | 83 | 49 | 7  | 8  | 6 | |

Key: A- Assertives
D- Directives
DC- Declaratives
E- Expressives
C- Commissives

Table 3: Gender Language Features

| Dialogue | MALE | | | | | | FEMALE | | | | |
|----------|------| | | | | | | | | | | |
|          | IN | V | H | PE | TQ | MR |          | IN | V | H | PE | TQ | MR |
| 1        | 5  | 23| 3 | 3  | 3 | 3 | 1        | 12 | 38 | 5 | 1 | 1 | 1 |
| 2        | 12 | 3 | 23| 3  | 2 | 6 | 2        | 10 | 9  | 1 | 4 | 8 | 1 |
| TOTAL    | 17 | 46| 6 | 5  | 9 | Total    | 22 | 27 | 6 | 5 | 9 | |

Key: IN = Intensifiers
V = Vernacular
H = Hedges
PE = Polite Expressions
TQ = Tag Questions
MR = Minimal Response

4. DISCUSSION

Tables 1, 2 and 3 above showed that women and men employed many language features in the various mix-sex dialogues selected from the texts. Among socio-cultural, psychological, physical, and historical contexts, the results of the analysis showed that the language use of both sexes was done within a socio-cultural setting such as discussions about family affairs, business meetings at the hotels, lunch hours, marriage ceremonies and festive party periods. Women and men speakers reflect their roles in the society, also, the kinds of relationships they keep with their interlocutors had a great influence on their choice of words. However, the topic of their discussion is very pertinent because it determined their language use. This reflects how men and women came about the choices they made in the discussions they had with each other.

Among the following language features: intensifiers, vernacular, hedges, polite expressions, tag questions and minimal responses were examined and analyzed. Men and women use of hedges is nearly of equal degree (male 46 while female 47) to show hesitancy, avoid being too categorical and to make statements less certain. Intensifiers were used more by women to show emphasis, degree and extent at which something happened. The mood system analysis showed that men and women used declarative expressions equally and they used this in making assertions like suggesting, putting forward a point, boasting and making conclusive statements. Also, male interlocutors used more of indicative interrogatives than the female interlocutors in the selected texts. The difference in their use of indicative interrogatives is nine (9) and are used in asking direct questions from the female counter-part; direct questions on marriage issues and love lives. They also used this to seek clarifications from their spouses on their position as the head of their marriages. Women used indicative interrogative to ask indirect questions while men asked direct questions.
Among the categories of Searles Speech of Acts; assertive, commissive, directives, expressive, and declaratives, the analysis showed that women used more of directives and a little more of assertive languages and used directives in expressing indirect statements. For instance;
Olanna: are we still trying to have a child? = she is rather trying to say that it has lingered
Olanna: its the students, isnt it? = this is rather a declarative trying to confirm her assumption.
Olanna: arent you going to play tennis? = she already has a fore knowledge of this, yet she asked.
It was discovered that women used directives in making requests than asking questions while men used more of assertive to put forward their points and suggestions.

5. CONCLUSION AND RECOMMENDATIONS
5.1 Conclusion
This study, language differences in gender as it relates to context is designed through sociolinguistics with an aspect from pragmatics. Sociolinguistics deals with how language is a reflection of what goes on in our society and the influence of the society on language. The nature of the mood type employed by men and women in the selected texts was more of indicatives and declaratives while declaratives were used by both genders in the texts to make statements that showed the tone of the interlocutors language choices.

In every language use in Speech Acts, be it assertives, commissives, directives or declarations, it was discovered that men used more directives while women used more of assertives. Considering the influence of the context (socio-cultural-marriage and courtship), where women used expressions that showed their position and level in marriage custom and tradition; a humble person; It was discovered that women used more intensifiers than men. The function of intensifiers in sentences showed that women were truly in control of their discussions with men since intensifiers are possible to:
- Make adverbs or adjectives stronger in sentences.
- Strengthen the meaning of other expressions and show emphasis.
- Increase the emotional content of expression
- Add force to the meaning of verbs, adjectives or other adverbs.
However, the predetermine ideas by Lakoff (1973) about womens language being weak and inferior has been influenced by the nature of language use by male and female in the selected texts.

5.2 Recommendations and Suggestion for Further Studies
There are other areas of investigation which arises from this study that can be explored to enrich the application of analyzing discourse to real conversations and more African literary texts. Apart from investigating the language features of both genders, it would be worthy to study other areas like critical discourse analysis, ethnomethodology of speaking, gender-specific vocabularies, gender language difference in religion, medicine and in childrens world. It would also be useful to carry out the conversational analysis of gender language use of youth in secondary schools in other to re-orientate students on the assumptions that females use inferior language while male use superior language features, hence, helping to build their minds and integrity as it determines their English Language Use.

REFERENCES


ABSTRACT

Recession and economic depression is a major source of poverty in both rural and urban parts of Nigeria today. It is a fact that the government alone cannot solve the economic challenges of the populace. This ugly trend has resulted in no small measure to poverty, unemployment and many other economic hardships for the citizenry. Thus, small scale business has provided a succor for economic growth among the rural women. This paper examines the effect of small scale business in enhancing the economic growth of rural women in Ilaro Yewa South Western part of Nigeria. Cluster sampling technique was employed to selected ninety (90) small scale entrepreneurs in Ilaro for the study. The questionnaire instrument was designed to collect data from the respondents. The structured questionnaire was divided into two parts. Simple percentage was employed to analyse the data. The result shows that greater percentage of the women now engage in small scale businesses to survive and sustain the meager income of their families. The result also shows that creations of jobs by women entrepreneurs have reduced the rate of crime in Ilaro. From the results, it is recommended, that the rural women entrepreneurs need to be given workshops on various strategies they can employ to add values to their businesses and how to source for loans for their businesses; this will invariably help to reduce the poverty level in the society.

KEYWORDS: Small Scale Business, Economic growth, rural women, poverty alleviation, entrepreneur.

1. INTRODUCTION

One of the most important issues of humanity is economic growth. In Ilaro Yewa South Local Government economies, recession and prosperity periods are regularly succeeding with different types of small scale business. This is one of the most effective tools for ending poverty and achieving sustainable development. The traditional roles played by women in a typical Ilaro Yewa South Local Government family setting are enumerable. In Ilaro, for example, as a result of the inadequate establishment of government outfits and industries, apart from the federal higher institution and cement factory, majority of the women engage in small scale business activities such as hair dressing, catering, fashion designing, farming, soap making, ‘fufu’ processing, poultry, fish farming, etc. Thus, they play complementary roles in providing for their families and thereby contributing to the economic growth of the society. A small scale business can be defined in many ways and has different meanings to different people. The parameters for the definition include value of assets, number of employees, sales revenue, size of capital, and turnover rate.

According to Onuoha (2014), a small scale business is one that is independently owned and operated, and in which the owner is the sole decision maker and the overall boss. A small scale business has also been described as a small enterprise in which the manager personally performs all the functions of management. Other scholars see small scale business as a manufacturing establishment employing less than ten (10) workers and having capital base not exceeding two (₦2,000,000) million naira. Arvind (2008) opined that small scale business has less than 100 employees, owned by one or few individuals with the exception of the marketing function, has geographically localized operations and does not dominate the industry. A small scale business is a business that is not large in terms of its size, scope of operation, financial involvement and the workforce involved. Most small scale enterprises are owned by one entrepreneur. To Nicholas (2007), a small scale business must have few employees, limited capital investment and small scale operation. This is said to be a firm that is independently owned, and operated by a sole proprietor and it is not dominant in its field of operation. In essence, it is a business in which its owner influences the entire decision-making process, the business has relatively small market share and low capital requirement for its operation. The small scale businesses have the potentiality of reducing the rate of unemployment in Nigeria, thus contribute to the Gross Domestic Product (GDP) and economic growth of the nation (Oshagbemi, 2010). The industrialized nations having attained technological advancement today owe their present position to the establishment of small scale industries in the past. These serve as pivot for technological take off and self-reliance. In most cases, these small scale businesses

1st National Conference of WITED, Ilaro Chapter
are majorly established and controlled by women not only to boost their economic independence but also the economic growth. However, there are various hindrances that are encountered in becoming successful entrepreneurs. These are finance, weather, marketing, transportation, storage facilities, social constraints, etc. It is perhaps for these reasons that government bodies, NGOs, social scientists, researchers and international agencies have started showing interest in issues related to small scale businesses among women in Ilaro Yewa South Local Government. This is because empowerment is the vehicle to socio-economic growth of women entrepreneurs. Succinctly, to Rana and Masood, 2011, the number of women who have entered the field of small scale businesses in recent times has increased tremendously.

In Ilaro for example, the emergence and growth of these businesses have contributed to the economy and the society at large. As a result of this trend, women became empowered to be self-reliant, thereby contributing effectively to the progress and sustainability of their homes and the economy. A major characteristic of small-scale business in Nigeria relates to ownership structure which largely revolves round a key man or a family. Hence, majority of the small-scale business is either sole proprietorship or partnership. Even where the registration status takes the shape of limited liability company, the true ownership structure is that of a one-man or partnership business.

Dozie (1995), Owualah (1999), and Lawal (2000), described the characteristics of small scale enterprises as follows:

- Personal savings of the owner form the start-up capital of the business
- Low Initial capital requirement
- Simple technology, etc.

The major aim of this study is to examine small scale business as a tool of enhancing economic growth of rural women in Ilaro Yewa South Local Government, Ogun State. Other specific objectives include: to analyse the effect of the activities of women on the reduction of poverty level in Ilaro Yewa South Local Government; Ogun State; to examine the impact of women entrepreneurs on the creation of employment opportunities in Ilaro Yewa South Local Government, Ogun State and to determine the impact of women entrepreneurs’ activities by way of job creation and the reduction of crime rate in Ilaro Yewa South Local Government, Ogun State.

2. LITERATURE REVIEW

2.1 Women and Small Scale Business

According to Pareek (2012), women in small scale business are referred to as females who play captivating part by repeatedly interacting and keenly adjusting herself with financial, socio-economic, and support spheres in society. The impact of small scale business on women is gaining recognition intensely; worldwide. As the number of female business owners continues to increase steadily, they continue to have impact in the Ogun State economy. Women in small scale business around the Ilaro Yewa are major contributors to the economy. Women contribute numerous ideas, great deal of energy and capital resources to their communities and generate jobs as well as create additional work for suppliers and other spin-off business linkages. Despite these, there are major challenges they encounter in the course of carrying out their business activities. These are mostly gender-based discrimination, lack of shared support, limited or no access to information, not enough education & training facilities, lack of trust in their capabilities and access to resources (Afza, Hassan, and Rashid, 2010).

2.2 Reasons for Engaging in Small Scale Business

There are several factors which can propel women to be involved in small scale business. These are personal motivations, socio-cultural factors, availability of finance, government schemes support and business environment. Mallika Das (2000) observed in her study that most common reasons for the success of women in small scale businesses are personal qualities such as hard work and perseverance. Some independent factors are market opportunity, family factors which vary according to parameters such as region, gender, age, family background, and work experience. Several surveys conducted in different parts of the world regarding women in small scale business management showed that women have proved to be good entrepreneurs for the following reasons: economic independence, love for establishing one’s personal idea, social identity, achievement of excellence, confidence, status in society, greater freedom and mobility.

2.3 Challenges of Small-Scale Business

Kishor and Choudhary (2011) in their study, emphasized that despite the fact that small scale business has the potentials for empowering, liberating improving, and creating an opportunity for women well-being, there are many challenges encountered by them. Kumari (2010) conducted work in the rural areas, the results of the study indicated lack of supportive network, financial and marketing problems were the major problematic areas for
rural women who involve in small scale business. The main challenges faced by rural women in business are lack of technical knowledge and skills in making a balance between their time, work & family. Some of the challenges faced are as follows:

i. **Dual role of women: overlapping of business and family**
As the boundaries between the business and the family tend to be indistinct, women operating small scale businesses face a unique set of issues related to personal identity, role conflict as wives and mothers, family relationships, and attitudes towards authority. Additionally, businesses owned by women are financially disadvantaged and are forced to rely on internal resources for managing the business rather than from outsiders.

ii. **Problem of finance**
There are several bottlenecks and a gap in availability of credit for women. The multiplicity of schemes is not adequately listed nor is there networking among agencies. As a result, clients approaching one institution are not made aware of the best option for their requirements.

iii. **Illiteracy among rural women**
The literacy rate of women in Ilaro Yewa is found at low level compared to male population. The rural women are ignorant of new technology or unskilled. They are often unable to do research & gain the necessary training. The uneducated rural women do not have the knowledge of measurement and basic accounting.

iv. **Lack of information and assistance:**
Another significant need of many women business owners is obtaining the appropriate assistance and information needed to take the business to the next level of growth.

v. **Need of training and development**
Most women who were involved in small scale business do not have time to attend training and development programmes. They consider this as a waste of time, they rather give more emphasis on not missing a single daily sales opportunity.

vi. **Male dominated society**
The male-female competition is another factor, which develop hurdles to women entrepreneurs. Despite the fact that women entrepreneurs are good in keeping their service prompt and delivery in time, due to lack of organizational skills compared to male entrepreneur, women face constraints from competition. The confidence to travel hinterland day and night and even different regions and states are less found in women compared to male entrepreneurs. This shows that the low level freedom of expression and freedom of mobility of the women entrepreneurs.

vii. **Competition**
Women also face competition not only from relatively bigger companies but other small enterprises that engage in similar businesses.

2.4 **The Role of Small Scale Business in Economy Growth**
There are many roles played by small scale businesses amongst which are

i. **Job creation:** Small scale businesses create more jobs for women. A study revealed that it accounts for as much as 65 percent of all new employment each year. This type of business creates new jobs at faster rate than larger, older business, for instance when a poultry farm is established, it will create jobs for at least five or more people.

ii. **Innovation:** This is referred to as the translation of a new idea into a new company product, service or new method of production. As a result of the ability to think on new ideas, significant changes and benefits are derived from new products by the society and customers.

iii. **Productivity:** This is the ability to produce more goods and services with less labour and other inputs.

iv. **Reduction in rural-urban migration:** The development of small scale business particularly in rural areas has led to substantial reduction in migration from rural to urban centres. As a matter of fact, people living in urban centres are now more interested in migrating to the rural area for search of business opportunities in the small and medium enterprises and even setting up their own cottage industries because of the relatively low competition and high success rate.
v. Increase in the standard of living: Small scale business creates new products and services which improve the standard of living of the public at large. This is because people easily get the basic or essential goods for their survival.

Small scale business encourages improved services and reduction in the cost of processing goods and services due to dynamic competition. These outfits improve the quality of living standard and economic growth for women especially.

vi. Conservation and generation of foreign exchange: Small scale business activities generate foreign exchange from products and services which are imported to other countries e.g. honey, leather works, etc.

3. RESEARCH METHODOLOGY

This research work is descriptive. Collection of data was done for the purpose of investigating small scale business as a tool of enhancing economic growth of rural women from Ilaro Yewa South Local Government, Ogun State. It also involved sampling by using structured questionnaire to generate data that was used in the analysis so as to gain insight into the topic under investigation. In this study, the measurement types, sampling size, data collection and data analysis method, were employed, as stipulated by Cooper and Schindler (2003).

The technique used in the analysis of data collection was mostly descriptive. Analysis of data by simple percentage enabled the study of different opinions in the assessment. The targeted audience were small scale business owners and the sampling technique adopted in selecting a convenient sample size is Cluster sampling techniques.

Ilaro town was divided into four (4) clusters namely; Orita/Express, Gbogidi, Igboro and Sabo units. Thus, sample sizes of thirty (30), twenty-five (25), twenty-five (25) and ten (10) entrepreneurs were respectively selected from each cluster unit proportional to the perceived size of each unit. This gives a total sample size of ninety (90) from whom structured questionnaire were examined.

3.1 Data Analysis

The total number of ninety (90) questionnaires were administered to small scale entrepreneurs in Ilaro. 100% were returned and they were all filled by the respondents. The highest percentage of respondents was the female with 53.3% while the lowest percentage of respondents was the male with 46.7%. The age showed that 28.9% of the respondents were aged between 22-26 years, 22.2% were between 18-21 years, 20% were between 27-32 years, 16.7% were between 33-38 years and the remaining 12.2% were between above 39 years. The marital status showed that 45.6% of participants were married, 35.6% were single while 10% were widowed and 8.9% were divorced.

Table 1: Percentage Analysis of small scale business effect on poverty reduction

<table>
<thead>
<tr>
<th>Response</th>
<th>Respondents</th>
<th>Percentage (%)</th>
<th>Cumulative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>63</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey 2019

The table above shows that 70% of the respondents said ‘Yes’ and 30% of the respondents said ‘No’. Majority were of the opinion that the activities of women entrepreneurs have an effect on the poverty level in Ilaro Yewa South Local Government, Ogun State.

Table 2: Percentage Analysis of employment creation by small scale business entrepreneurs

<table>
<thead>
<tr>
<th>Response</th>
<th>Respondents</th>
<th>Percentage (%)</th>
<th>Cumulative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>83</td>
<td>92.2</td>
<td>92.2</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>7.8</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey 2019
The table above shows that 92.2% of the respondents said ‘Yes’ and 7.8% of the respondents said ‘No’. Majority were of the opinion that women in small scale businesses create employment opportunities in Ilaro Yewa South Local Government, Ogun State.

<table>
<thead>
<tr>
<th>Response</th>
<th>Respondents</th>
<th>Percentage (%)</th>
<th>Cumulative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>85</td>
<td>94.4</td>
<td>94.4</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>5.6</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey 2019

The table above shows that 94.4% of the respondents said ‘Yes’ and 5.6% of the respondents said ‘No’. Majority were of the opinion small scale business by women entrepreneurs’ activities reduces the rate of crime in Ilaro Yewa South Local Government, Ogun State.

<table>
<thead>
<tr>
<th>Response</th>
<th>Respondents</th>
<th>Percentage (%)</th>
<th>Cumulative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>69</td>
<td>76.7</td>
<td>76.7</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
<td>23.3</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey 2019

The table above shows that 76.7% of the respondents said ‘Yes’ and 23.3% of the respondents said ‘No’. Majority were of the opinion that they have inadequate knowledge of the risks facing their business.

<table>
<thead>
<tr>
<th>Response</th>
<th>Respondents</th>
<th>Percentage (%)</th>
<th>Cumulative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>57</td>
<td>63.3</td>
<td>63.3</td>
</tr>
<tr>
<td>No</td>
<td>33</td>
<td>36.7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey 2019

The table above shows that 63.3% of the respondents said ‘Yes’ and 36.7% of the respondents said ‘No’. Majority were of the opinion that the availability of short, medium and long term capital contributes to the success of a business.

<table>
<thead>
<tr>
<th>Response</th>
<th>Respondents</th>
<th>Percentage (%)</th>
<th>Cumulative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>64</td>
<td>71.1</td>
<td>71.1</td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td>28.9</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey 2019

The table above shows that 71.1% of the respondents said ‘Yes’ and 28.9% of the respondents said ‘No’. Majority were of the opinion that inadequate access to financial resources and credit facilities hamper the success of a business.

3 RESULTS AND DISCUSSION OF FINDINGS

The result of research questions raised in the questionnaire showed that small scale business has a great impact on the economic growth of women in Ilaro.
Secondly, the result exposed that women involvements in small scale business activities have effect on the poverty level in Ilaro Yewa South Local Government, Ogun State. This is because many who were unable to secure employment in government sector engage in small scale business and thus were able to provide for themselves and their immediate families. As a result of this, poverty level in the area has reduced tremendously.

Thirdly, due to the activities of women in small scale business, many job opportunities have been created this has led to reduced crime rate in Ilaro Yewa South Local Government, Ogun State.

Fourthly, it was revealed that most of the women entrepreneurs did not have adequate knowledge of the risks involved in business. This in most cases led to premature death of their businesses.

Fifthly, the study reveals that most women entrepreneurs do not have access to sufficient capital either short, medium and long term capital that could contribute to the success of their business. This is due to the request for collaterals by financial institutions before loans could be accessed by their customers.

4. CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion
Findings showed that small scale businesses contribute immensely to the economic growth of rural women in Ilaro South Local Government. This is because, through small scale business, there is creation of employment opportunities for individuals especially women who would have migrated to urban cities in search of white collar jobs. Secondly, through small scale businesses, the level of prostitution, poverty and crime among the women is reduced to the barest minimum in the Ilaro metropolis. Also, the contributions of small scale businesses cannot be over-emphasised and this has been recognized as the main economic sustainability. This is because, small scale businesses have the capacity of enhancing the economy output and human welfare (Akingunola, 2011).

4.2 Recommendations
Based on the results and findings, the following recommendations are made as a way of preventing and eradicating poverty among women in the rural areas:

- Government should re-introduce the small scale business credit scheme without collaterals so that beneficiaries can use them to run their small scale businesses.
- Government, Chamber of Commerce and other Non-Governmental Organization (NGO) should regularly organize seminars for potential and active small scale business operators in order to educate them on how to plan, organize, direct and control their businesses.
- Small scale business operators should device effective marketing strategies. This includes such promotional strategies such as advertising, good management/customer’s relations at all times.
- Government should improve on the provision of infrastructural facilities such as good road network, electricity, etc. in rural areas.
- The use of indigenous products should be encouraged and intensified by the government so that there will be ready market for the cottage industries.
- Government at all levels should reduce the taxes levied on small scale business entrepreneurs.
- Small scale business entrepreneurs should be encouraged to participate in national or international Trade fairs and exhibitions.

REFERENCES


ACQUISITION OF ICT SKILLS FOR ECONOMIC DEVELOPMENT IN OGUN STATE

Adebayo, Aminat A. & Oderinde, Oluwafemi A.
The Federal Polytechnic, Ilaro

ABSTRACT

ICT skills are learned abilities used for the operation of ICT gadgets. This forms one of the fastest expanding skill-sets and is currently in high demand across multiple markets. More than just as an industry of its own, ICT has also permeated into different job functions, evolving from being a specified niche to becoming a basic requirement across different fields. This study therefore examined the impact of acquisition of ICT skills on the economic development in Ogun State. The population used for the study comprised of one hundred and sixty ICT operators, students and ICT administrators in the Three Senatorial District Areas of Ogun State: Ilaro, Itori and Sapade. One hundred respondents were selected through purposive sampling techniques. For the study, three research questions were raised and twelve questionnaire related items were formulated to make a structured questionnaire. One hundred copies of the structured instrument were produced and administered on the One hundred respondents. Acquisition of ICT skills such as computer is a veritable tool for economic development. It was recommended among others that the government should create enabling environment in order to boost citizens’ interest in acquisition of ICT skills towards sustaining the economic growth and development of Nigeria.

Keywords: Acquisition, ICT skills, Opportunities, Economic development and Nation.

1. INTRODUCTION

The role being played by Information and Communication Technology (ICT) in economic growth and development of any nation cannot be overemphasized. A nation like Nigeria as one of the developing countries of the world has started to look at ICT as magic bullet to solve her developmental problems. A recent 2007 publication of the Africa Capacity Building foundation asserted that the level of interest in technology solutions to critical development challenges is high in Africa, which raises a need to accelerate the penetration and application of technology on the continent, particularly in the public sector.

In today’s business world, ICT skills are one of the fastest expanding skill-sets and are currently in high demand across multiple markets (Kenny, 2002). More than just as an industry of its own, ICT has also permeated into different job functions, evolving from being a specified niche to becoming a basic requirement across different fields. Such skills are also necessary for students entering into the working-world; however, it appears that many may have a misperception of their actual digital proficiency, vastly overestimating their skills against the actual reality of their performance. This gap is critical and it is up to Educational Institutions to address this by implementing more of such ICT skill-sets into their curriculum (Dymond & Oestmann, 2002).

Khasiani (2000) examined some ICT skills needed for promoting economic development of a nation which include: computer skills, analytical skills, interpersonal skills, manipulative skills, application skills, programming skills, software and hardware skills and so on, which are used to retrieve, assess, store, produce, present and exchange information and to communicate and participate in collaborative networks via the internet.

In the context of learning, especially in areas of socio-educational vulnerability, ICT can be an important tool to guarantee quality, relevance and equity in the level of educational achievement. ICTs have the potential to democratize access to knowledge and to develop meaningful learning experiences using the educational material available in them. According to Pedro (2006), the new generations demand a greater use of technologies to achieve economic success of a nation. The Internet, for example, based exclusively on written text and used in a non-sporadic way, would provide job opportunities to citizens of a nation.

Furthermore, the link between economic growth and ICT has been well established (Jalava & Pohjola, 2002, Kraemer & Dedrick, 2001). The exact processes of how ICT can be used for poverty reduction in developing
countries need exploration and are open to challenge (Kenny, 2002). ICT as enabler in the development process and in poverty reduction has or makes use of two approaches — ICT as a tool to promote economic growth (ICT-driven approach) and ICT as support of economic development.

In the ICT-driven approach, often underpinned by the assumption that better information improves how economic resources are allocated, one tries to empower the poor in the rural and urban areas by intervening to correct issues such as scarce, poor, inefficient, and untimely information by providing village knowledge centers. In this approach ICT can also be used to enhance health, education, social capital, etc. The other approach of using ICT in support of development first identifies the development goal (e.g., health care provision, increased agricultural yield, etc.), works out what the ICT needs of the target group are and then looks at how ICT and other media can play a role in providing and easing channels of communication. In using ICT to support development, the role of the poor in the identification of their information needs is greatly stressed, (Heeks, 2002).

Ouagadougou (2015) identifies the importance of ICT to promote sustainable economic development, poverty alleviation and the enhancement of the quality of life for a nation in which the need of ICT skills is required for application and achievement of technological goals. ICT skills can assist in improving efficiency and effectiveness of public sector institutions by creating the enabling environment for the economy to increase her competitiveness, (Cristia, Ibarrraran, Cueto, Santiago & Severin, 2012; Torres & Padilla, 2015).

1.1 Statement of the Problem

Lack of ICT skills; the bane of economic development is a deterrent for people to use the ICT gadgets. This constitutes a major constraint for people to go online. Today, online activities get complex, fewer people are undertaking these activities. This pointed out the importance of ICT skills for individuals in the society, employment and general well being. Computer users in developed countries have more ICT skills than those in developing countries which prevent people in those countries from using the internet. The cost of acquiring ICT gadget as one of the major factors discouraging people in developing countries from using the equipment aside from the lack of fundamental ICT skills.

ICT skills are fundamental to achieving positive while also avoiding negative results. Transferable ICT skills are indispensable in the face of increasing complexity of ICT system. Hence, the skills to use ICT are fundamental to participate in an increasing ICT world. This study therefore examined how ICT skills could be used as a veritable tool for economic development.

1.2 Objectives of the Study

The main objective of this study was to examine how acquisition of ICT skills can serve as a veritable tool for economic development in Ogun State. The specific objectives are:

- To identify the available ICT skills needed to acquire for economic development in Ogun State
- To determine how the acquisition of ICT skills would impact the lives of people in Ogun State
- To identify an extent to which ICT could be used to sustain economic development of Ogun State.

The following research questions were raised on the study

- What are the available ICT skills needed to acquire for economic development in Ogun State?
- How would the acquisition of these ICT skills impact the lives of people in Ogun State?
- To what extent would ICT be used to sustain economic development of Ogun State?

2. METHODOLOGY

The study was a survey and carried out in Ogun State. The population used for the study comprised of one hundred and sixty ICT operators, students and ICT administrators in the Three Senatorial District Areas of Ogun State: Ilaro, Itori and Sapade. A total number of one hundred (100) respondents were purposively sampled. Questionnaire was the main instrument used to gather data for the study. The instrument was validated by knowledge-based workers. The instrument consisted of twelve items seeking information on the acquisition of ICT skills for economic development in Ogun State. Respondents were asked to choose one out of the four options (Strongly Agree, Agree, Disagree and Strongly Disagree) provided for each item of the questionnaire.
For the purpose of analysis, values were assigned to the four options provided in the instrument as follows: Strongly Agree = 4 marks, Agree = 3 marks, Disagree = 2 Marks and Strongly Disagree = 1 mark respectively. Mean method was used to analyse the data collected. One hundred copies of the questionnaire were administered on the selected respondents used for the study. However, all the copies of questionnaire administered were returned. A minimum of 2.5 score was set as standard for acceptability; any score below the set standard was rejected.

3. RESULTS

Table 1: Mean rating of the respondents’ responses on the available ICT skills needed to acquire for economic development.

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Items</th>
<th>SA</th>
<th>A</th>
<th>SD</th>
<th>D</th>
<th>Mean</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Computer skill is needed.</td>
<td>68</td>
<td>25</td>
<td>5</td>
<td>2</td>
<td>3.59</td>
<td>Upheld</td>
</tr>
<tr>
<td>2.</td>
<td>Application skill is required.</td>
<td>83</td>
<td>12</td>
<td>4</td>
<td>1</td>
<td>3.85</td>
<td>Upheld</td>
</tr>
<tr>
<td>3.</td>
<td>Programming skill is also needed.</td>
<td>90</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>3.87</td>
<td>Upheld</td>
</tr>
<tr>
<td>4.</td>
<td>Analytical skill is also required.</td>
<td>88</td>
<td>10</td>
<td>2</td>
<td>-</td>
<td>3.86</td>
<td>Upheld</td>
</tr>
</tbody>
</table>

Field Survey, 2019

Data collected and analysed in table one above showed that all the items raised were considered by the respondents as available ICT skills needed to acquire for economic development in Nigeria. This can be deduced from the mean score of the above respondents in all the items raised which was more than 2.5.

Table 2: Mean rating of the respondents’ responses on how the acquisition of ICT skills would impact the lives of Nigerians.

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Items</th>
<th>SA</th>
<th>A</th>
<th>SD</th>
<th>D</th>
<th>Mean</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>It makes citizens to be Self-reliance.</td>
<td>79</td>
<td>20</td>
<td>1</td>
<td>-</td>
<td>3.78</td>
<td>Upheld</td>
</tr>
<tr>
<td>6.</td>
<td>It makes citizens to meet-up with the world standard technologically.</td>
<td>85</td>
<td>12</td>
<td>1</td>
<td>2</td>
<td>3.78</td>
<td>Upheld</td>
</tr>
<tr>
<td>7.</td>
<td>It enhances job opportunities of citizens.</td>
<td>77</td>
<td>22</td>
<td>-</td>
<td>1</td>
<td>3.75</td>
<td>Upheld</td>
</tr>
<tr>
<td>8.</td>
<td>It creates avenue for citizens to grow and develop their capacity.</td>
<td>90</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3.82</td>
<td>Upheld</td>
</tr>
</tbody>
</table>

Field Survey, 2019

Data collected and analysed in table two above showed that all the items raised were considered by the respondents as how the acquisition of ICT skills would impact the lives of Nigerians. This can be deduced from the mean score of the above respondents in all the items raised which was more than 2.5.

Table 3: Mean rating of the respondents’ responses on the extent to which ICT could be used to sustain economic development of Nigeria.

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Items</th>
<th>SA</th>
<th>A</th>
<th>SD</th>
<th>D</th>
<th>Mean</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>It helps to provide employment in the country.</td>
<td>85</td>
<td>17</td>
<td>2</td>
<td>1</td>
<td>3.96</td>
<td>Upheld</td>
</tr>
<tr>
<td>10.</td>
<td>It helps to reduce corruption of public office holders in the system.</td>
<td>67</td>
<td>30</td>
<td>1</td>
<td>2</td>
<td>3.62</td>
<td>Upheld</td>
</tr>
<tr>
<td>11.</td>
<td>It helps to solve insecurity challenges experienced in the world especially in Nigeria.</td>
<td>86</td>
<td>12</td>
<td>-</td>
<td>2</td>
<td>3.82</td>
<td>Upheld</td>
</tr>
<tr>
<td>12.</td>
<td>It enhances close relationship between the government and the citizens in terms of governance.</td>
<td>90</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>3.85</td>
<td>Upheld</td>
</tr>
</tbody>
</table>

Field Survey, 2019

Data collected and analysed in table three above showed that all the items raised were considered by the respondents as the extent to which ICT could be used to sustain economic development of Nigeria. This can be deduced from the mean score of the above respondents in all the items raised which was more than 2.5.
4. DISCUSSION

Research question one was used to determine the available ICT skills to acquire towards economic development of Nigeria. From the data collected and analysed, it was discovered that there are a lot of ICT skills available to citizens of Nigeria for economic development. This was evident in the responses of the respondents to all the items raised on this research question. There is no doubt that computer skill, analytical skill, programming skill, software and hardware skills, manipulative skills and application skills form some of the needed ICT abilities to sustain economic development of a country, (Khasiani, 2000).

Research question two was raised to determine how ICT skills acquired would impact the lives of Nigerians. From the responses of the respondents which were analysed, it was clearly shown that the acquisition of ICT skills by citizens would make them to be self-reliance by providing opportunities for themselves in the technological world of ICT, make them to meet-up with the world standard, technologically, enhance their job opportunities to be ICT facilitators to the government and students and create opportunity for them to grow and develop their capacity towards sustaining economic development of Nigeria, (Heeks, 2002).

Research question three was used to investigate the extent at which ICT could be used for sustaining economic development of Nigeria. From the data collected and analysed, it was discovered that there are a lot of opportunities a country can benefit from the use of ICT for job creation for the citizens of the country, reduce corrupt practices of public holders from the system, useful in solving insecurity challenges in the country and aid close relationship existing between the government and the people in fostering effective communication, (Torres & Padilla, 2015).

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

ICT skills have the potential tendency to improve the quality and relevance of ICT and economic development of a nation, but their real impact will depend on the technological competencies installed in the citizens and the pedagogical intentionality that is systematically derived from it. Along with the use of communicative leisure, a less rudimentary technological appropriation and educational function is required, a particularly relevant challenge in the most vulnerable contexts.

The importance of ICT skills is to promote sustainable development, poverty alleviation and the enhancement of the quality of life for a nation in which the need of ICT skills is required for application and achievement of technological goals. ICT skills assist in improving efficiency and effectiveness of public sector institutions by creating the enabling environment for the economy to increase her competitiveness among other countries of the world.

5.2 Recommendations

From the results and findings of the study, the following recommendations were made:

- Government should create enabling environment for ICT to have it stand in the country to encourage citizens to acquire ICT skills.
- Teaching of ICT skills should be incorporated into the curricula of Educational Institutions in Nigeria.
- Citizens should develop their ICT skills for self-reliance.
- Government subsidy to reduce the cost of acquiring ICT equipment.
- Manpower Training on the maintenance of ICT equipment.

REFERENCES


INFRASTRUCTURE DEVELOPMENT AND ECONOMIC GROWTH; A CASE STUDY OF OWO TOWN

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Abstract

This paper has explored the relationship between infrastructure development and economic growth with particular reference to Owo city in Ondo State, Nigeria, for this purpose a time series data for the period between 1965-2014 to show the population growth rate in every five year was used. A systemic random sampling of one in every houses in some quarters/ major street was done through a well-structured questionnaire. Other source of information used were interviews, and observation. Data collected reviewed that there was upsurged in population which had a multiplier effect on some factors that caused the absurdity that resulted in urban decay of infrastructure in Owo. It was observed that the city lacked some social infrastructure like stable power/ electricity supply, good road network, water supply, drainage supply and commercial buildings like banks and market when compared with the rate of population growth. The study concluded that if urban city are well coordinated with vibrant law, defined polities and prudent administration, infrastructure development would be sustained. This paper recommends that government should give more consideration to the rehabilitation of infrastructure.

Keywords: Infrastructure, development, population, economic growth.

1. INTRODUCTION

Infrastructural facilities in urban area are essential developmental projects targeted at the need of the people to make life convenient for carrying out economic activities and is subjected to public regulation in terms of standard and pricing. These facilities consist of housing, water supply, drainage system, electricity supply, good access road, health facilities, solid wastes disposal etc.

They are spread within the glomeration of tribes, communities and people that reside in the urban set up so that they act as assets of growth to its domain. Cities are engines of growth, incubators of innovations and centre of social transformation. Therefore urbanisation is important for diversified and dynamic economies which increase natural productivity (Ude, 2008).

It is worthy to note that the quality and quantity of infrastructure available in a given place or society is the yardstick for measuring the general level of development of that area and a major determinant of poverty development and their respective value trends.

Kunle 2002 established the fact that there is a high positive correlation between a developed infrastructure and sustained high rates of economic growth and trade coupled with a significant reduction in poverty, inequality and environmental degradation.

In Nigeria, for more than three decades, government had been using various methods to resolve urban problems in the area of infrastructural provision, but had not find viable solution for it. As these options had failed, government had resolved to privatise some infrastructural facilities as electricity supply, solid waste disposal, some roads projects etc. This was implemented in order to remove the financial burden from government as her ability was no longer buoyant enough to fund facilities development and maintenance, and also wanted to experiment whether the adapted method is matured enough to provide sustainable solution that would bring the expected urban transformation. The situation became more complicated because the selected private companies pretended to be rich in funding the program and also with qualified technical staff whereas most of them lack

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the financial responsibilities, the technical staff and genuine urban administrators that could explore the benefits of privatisation for people to enjoy instead they were greedy and exploitative.

1.2 Conceptual Framework

![Conceptual Framework Diagram]

Source: Hassan 2017

As the conceptual framework stipulate lack of social infrastructure promotes poor standard living, economic deficit, economic decline and free trade barrier that have negative impact on economic development.

1.3 Study Area

Owo city is located in lat 07014’N and longitude 05035’E of the Greenwich. it is 48km of Akure capital city of Ondo State and 400km North East of Lagos, both in Nigeria. Owo and its environs spread over an area of about 20 kilometer square and it is about 150meters above sea level. According to calculation from 1965 census, Owo population was 283,249 (Ojo et al, 2013). the core area covers an area of 1,341 hectares (Denito Planning, 1980) with six main traditional quarters bounded by defence moat. each quarter has however overgrown far beyond the traditional moat and has incorporated many major landmarks in process of its spatial expansion. the major economic base is agriculture however other activities like commercial, industrial, health, educational services etc has been incorporated to boost it.

2. LITERATURE REVIEW

Akingbohunbge (2002) confirmed that two thirds of urban housing in Nigeria were in varying degrees of serious disrepairs due to gross neglect and most of these houses and facilities were built sixty (60) years ago with low level of technology and without maintenance. He therefore suggested that a virile National Policy on maintenance that would guarantee adequate budgetary allocation, specify statutory standards of maintenance of all categories of building and to establish appropriate maintenance agencies that could overcome the existing decay and brought the expected transformation into urban areas. He elucidated further that the work of maintenance was a needed health care delivery system that had excellent abilities in persevering the performance standard, qualities and life span of facilities with a view of perpetuating its full capacity benefit and hence could be recommended as one of the measure that could curb urban decay.

Obabori and Olomu (2002) affirmed the inabilities of some cities to perform the expected basic functions. The rapid rate of increase in population was one of the factors responsible for city decay. The resulting increase overwhelmed the facilities and places the entire population in jeopardy. This mass movement from sub-urban to city centres create a staggering population in urban centres so that the provision of housing and other facilities become a concern to architects. As the expected balance between population increase and facilities provision was lost in a city, the population pressure and intensity caused many feature of the city to be broken down and its basic amenities exhibiting non performance or partial performance due to deterioration.

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optional remedy was the establishment of vibrant urban development Ministry to initiate, promote, consolidate and implement programs that would correct the wrong of the past. This ministry would enforce building codes and building bye-laws in construction of its structures and maintenance ability should conform to its Master plan while renewal should be necessary when situation demand it.

The authors concluded by recommending the adoption of sustainability strategy and all developments programs should be embarked upon by architects and other professionals in the building industry. Sustainable expansion scheme, sustainable satellite town scheme and sustainable new town scheme would form the basis for solving most of the decay in the city.

Umuokafor (2002) aimed to improve the infrastructure and maintenance of the environment of the area occupied by the urban poor. As the local or municipal government in the third world countries were financially handicapped and ill-equipped in personnel development in addressing planning, installation and maintenance of infrastructure, they gave it up to government who had a better financial base. Since the expected higher government could not generate the needed fund for possessing, operating and servicing of facilities, they eventually promoted privatisation because of the believe that the private companies would have enough money to own, operate, and service urban infrastructure. It was discovered that some of the private companies discriminate against investing on some facilities because the cost were high also in some areas they had majority of their inhabitants impoverished. Such areas were devoid of infrastructure and the existing one and their environments were subject to decay. The author was agitating for a non-profit organisation that should be set up by residents of a particular area to provide cheaper services and also to provide some basic facilities which investors were nonchalant about. Such organisations should be registered by local or city municipal government but their area of operation should be indicated. The author concluded that this was one of the sure ways to guarantee some services that were basic but not provided, and also to maintain cost recovery and increase coverage of the urban area and finally to reduce decay.

Adejumo and Taiwo (2006) observed the continuous increase in population had led to the multiplication of points of concentration and increase in sizes of individual concentration on Jos town and some Nigerian cities. This established enormous areas that cannot be totally covered by the Jos Metropolitan Development Board which some took the advantage by erecting illegal structures that contravened the law which finally end up in urban decay. Other factors that were responsible for city decay were poor mobility which makes effective monitoring to fail and inability of obeying planning and bye laws which are consequential to the emergence of slums. These slums lack sanitary facilities while light, air and privacy were grossly inadequate. Residential houses had been converted to commercial purposes along Bauchi road, Enugu road and Tafawa Balewa Street because the available markets could not meet the supply of the needs of the people.

As a result of many of these developments, the form and structure of the town could not conform to the design of the master plan which are evidences of urban decay. The author concluded that in order to check and restore the city from further decay, government (local and Jos Urban Metropolitan) should frequently update their offices with population data of the town by contacting the National Population Commission (NPC) office in the state for projection and expansion. Illegal developers should be checked by planning offices and government should open up new layouts and provide infrastructures and other transforming facilities for development.

3. METHODOLOGY

The methodology involved the systematic random sampling of one in every five houses and fifty questionnaires were distributed in each of the chosen areas (Ehinogbe, Iselu, Ijebu and Otutu) and the total no of questionnaires distributed were two hundred (200). Other methods included online information, observation, interviews. The following information were extracted from the questionnaires

i. Age of building
ii. Household size
iii. Water services
iv. Material for wall construction
v. Frequency of electricity
vi. Drainage system
4. FINDINGS, ANALYSIS AND DISCUSSION

Table 1: The Population of Owo from 1965-2014.

<table>
<thead>
<tr>
<th>Year (Column 1)</th>
<th>Population Every 5years increase (Column)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>80,413</td>
</tr>
<tr>
<td>1969</td>
<td>88,761</td>
</tr>
<tr>
<td>1974</td>
<td>100,425</td>
</tr>
<tr>
<td>1979</td>
<td>113,622</td>
</tr>
<tr>
<td>1984</td>
<td>128,554</td>
</tr>
<tr>
<td>1989</td>
<td>146,288</td>
</tr>
<tr>
<td>1994</td>
<td>165,511</td>
</tr>
<tr>
<td>1999</td>
<td>187,260</td>
</tr>
<tr>
<td>2004</td>
<td>216,011</td>
</tr>
<tr>
<td>2009</td>
<td>250,413</td>
</tr>
<tr>
<td>2014</td>
<td>290,297</td>
</tr>
</tbody>
</table>

Source: Survey data, 2016

2.5% growth rate from 1965-1999 and 3% growth rate from 2000-2013. From table, in 1965, the population of Owo was 80,413 and the projected population was 283,249 in 2013. In column 3 the population increase in every five years was recorded at the end of the 5th year starting from 1965. i.e. between 1965-1969, 1969-1974, 1974-1979 etc, the population increase is recorded as 8,348, 11,664, 13,197 respectively. This showed a progressive increase in population and this increase in population had a multiplier effects on other factors as high tenancy rate, extension of existing houses without permission from appropriate authorities, disobedience to Bye and Planning laws, non-conformity to master plan of the city, increase in water and electricity consumption without increase in power generation etc.

The results of the distributed questionnaires were as follows:

The age of the buildings could be identified as follows: 14.5% of the were between 1-20 years, 30% were between 21-40 years, 15% were between 41-60 years and 40.5% were above 60 years(Table 2). From the above data, 55.5% of the buildings were built more than forty years ago and houses of longer years were more subjected to devaluation of weather condition and utilisation of occupants. Therefore, these sets of buildings are not fit for economic activities and can hamper the economic growth of the town.

Table 2: AGE OF BUILDING

<table>
<thead>
<tr>
<th>S/N</th>
<th>Range</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1-20</td>
<td>29</td>
<td>14.5</td>
</tr>
<tr>
<td>2.</td>
<td>21-40</td>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>3.</td>
<td>41-60</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>4.</td>
<td>Above 60</td>
<td>81</td>
<td>40.5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Survey data 2016
The household size per room of respondents could be identified as follows: 1-4 persons per room 28%, 5-6 persons per room 51%, 8-10 persons per room 13% and above 10 persons per room 8% (Table 2). It can be deduced that 72% of the people residing in this environment live in rooms where 5 or more persons occupy a room. This resulted to congestion and if maintenance was not regular undertaken, this would be consequential to decay.

**Table 3: HOUSEHOLD SIZE (No. of people per room)**

<table>
<thead>
<tr>
<th>S/N</th>
<th>Range</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1-4</td>
<td>56</td>
<td>28</td>
</tr>
<tr>
<td>2.</td>
<td>5-7</td>
<td>102</td>
<td>51</td>
</tr>
<tr>
<td>3.</td>
<td>8-10</td>
<td>26</td>
<td>13</td>
</tr>
<tr>
<td>4.</td>
<td>Above 10</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Survey data 2016

From the data collected, it was discovered that the major source of water supply within the study area is well. 71% accounted for well water, public water 15%, treated water 5%, and buildings without water supply was 14.5% (Table 7). Water is essential to life as it is used by man for bathing, washing, flushing of toilets, scrubbing. Olawande Table 7b: **Values of Physcio-Chemical Parameters Waters in Owo and Environs** (1983) estimated the daily per capita need for these respectively for developing countries. From the data above, the 14.5% of the population were without water supply in the study area could cause havoc to the environment as there would be little or no water to carry out their daily activities which could result into outbreak of diseases.

**Table 4: WATER SERVICES**

<table>
<thead>
<tr>
<th>S/N</th>
<th>Type</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public water Supply</td>
<td>19</td>
<td>9.5</td>
</tr>
<tr>
<td></td>
<td>Well water</td>
<td>142</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Treated water</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Not Available</td>
<td>29</td>
<td>14.5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Survey data, 2016

On assessing the materials used for the construction of the walls, 58.5% were made of nonplastered mud, 29% of plastered mud, 7% made of timber, 3% made of nonplastered cement block and 2.5% (Table 4) made of plastered cement block. The non-plastered mud walls absorbed water during raining season and lost them in dry season. The continuity of these seasonal changes in volume for many years caused the walls of the buildings to be characterised with cracks while the plastered mud walls had reduced cracks. The nonplastered cement blocks still absorbed water while the while the plastered cement blocks were far better. The untreated and less treated timber walls were attacked by insects and got destroy. The understanding of the techniques of construction and preservation was also an essential factors in prevention of decay.
From the study, 71.5% of the respondents were not satisfied with the level of electricity supply in the area while the remaining 28.5% were satisfied (Table 9). This was partially due to the Federal Government’s privatisation policy of the power sector and the unwillingness of the distribution companies to supply electricity to low income areas compared to public companies. Private companies were reluctant in extending their services to poorer household especially when large investments were required (Umeokaforo, 2002).

### Table:5 MATERIALS OF WALL CONSTRUCTION

<table>
<thead>
<tr>
<th>S/N</th>
<th>Materials</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mud (Plastered)</td>
<td>58</td>
<td>29</td>
</tr>
<tr>
<td>2</td>
<td>Mud (not Plastered)</td>
<td>117</td>
<td>58.5</td>
</tr>
<tr>
<td>3</td>
<td>Cement Block (Plastered)</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>4</td>
<td>Cement Block (not Plastered)</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Timber</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>Others</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Survey data, 2016

### Table 6: FREQUENCY OF ELECTRICITY

<table>
<thead>
<tr>
<th>S/N</th>
<th>Request</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Frequent</td>
<td>57</td>
<td>28.5</td>
</tr>
<tr>
<td>2</td>
<td>Not Frequent</td>
<td>143</td>
<td>71.5</td>
</tr>
<tr>
<td>3</td>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Survey data, 2016

5. CONCLUSION AND RECOMMENDATIONS

#### 5.1 Conclusion

The study showed that infrastructure development plays a key role to sustain and accelerate the process of economic growth. More so, economic growth can be stimulated by making an investment in the major determinant of economic growth, that is, physical infrastructure. It therefore concludes that if city is well coordinated with vibrant law, defined policies and prudent administration, infrastructure development would be sustained.

#### 5.2 Recommendations

- As a result of population increase due to natural growth in birth and migration from the rural to urban cities which had mounted pressure on the available facilities that caused urban decay, there should be periodical population statistics in Owo and other cities for infrastructural planning and development.
- The local government is the closest to the people, it should be well equipped with vibrant and effective legislation for enforcing planning laws and development control, train their personnel and provide the finance required to tackle decayed infrastructure in their council areas.
- Urban planning should be environmentally conscious; owners of buildings (private, public and commercial) should be mandated to provide waste bins from which wastes can be collected by waste management vehicles that has been assigned to their areas.

Further research study should focus on other infrastructures like market, hospitals and banking facilities and their benefits.

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ABSTRACT

A study of the political history of Nigeria, like any other democratic society reveals that shaping or reshaping a course requires initiating enabling policies. Similarly, it is becoming increasingly clear in the wake of our deeper understanding of democracy that it is impossible to do things outside existing policies. It is therefore apposite that any form of restructuring in an organized society should commence with either amending the existing policies or initiating new policies that would support the entire idea. Therefore, it should be mentioned that driving the ideals of Women In Technical Education & Employment (WITED) requires putting in place favourable policies. However, it is instructive to state that initiating such policies demands that more women who are well disposed to the WITED ideals are put in the boardrooms, legislative chambers and other strategic places where they could be in commanding positions to do the needful. On this premise, it must be stated that the acid test of women’s sincerity towards promoting the ideals of WITED would be their resolve to participate in the politics of their environments to ensure that more women are part of the decision/policy making process. For instance, the edge that those from ‘educationally less advantaged states’ as well as the ‘disabled’ enjoy in the admission process into higher educational institutions today is a product of such favourable policies. It is in the light of the above that this paper seeks to explain that women participation in politics is critical to promoting WITED ideals.

Keywords: gender balance, politics, technical education, women empowerment.

1. INTRODUCTION

This paper seeks to explain that one of the fundamental instruments that would ensure the thriving of WITED is politics, (i.e. the actual participation of women in politics). This assumption is hinged on the understanding that every organized society operates based on principles, existing and documented policies/laws. This work also attempts to unravel, from historical point of view, the involvement of Nigerian women in technical, vocational and innovative activities during the pre-colonial era. It reveals that the aforementioned era saw huge participation of women in vocational and innovative ventures as it was being bequeathed from generations to generations until the advent of colonialism. However, following a successful entrenchment of colonial administration, there was a downturn in the level of women engagement in technical activities generally, and particularly in educational sector due to unfavourable policies of the colonial government.

Thus, the work maintains that the gender disparity in technical education in Nigeria today is traceable to the policies and drives of the colonial lords who saw women as weak and unfit for such venture. This has been validated by the proposition of Bola Udegbe when he mentioned that, with the colonial rule, came a denial of equal access to power and resources for women. Thus, the era was characterized by women’s disenfranchisement and massive erosion of their political and economic powers (Udegbe, 1981). Similarly, Toyin Falola asserted that the most serious threat to the influence and privileges of women occurred during the 20th century, when patriarchy combined with colonial changes to alter gender relations. As male chiefs collaborated with the British colonial administration in collecting taxes and governing, the position of women declined in importance. When the economy became increasingly geared toward the production of cash crops for export, Nigerian men and European firms dominated the distribution of rubber, cocoa, groundnut (peanuts) and palm oil. Women, pushed to the background, were forced to shift to the subsistence crops. Western-style education also favoured boys over girls and thus largely excluded women from many of the new occupations (including but not limited to technical/vocational education) introduced by colonial administration (Falola, 1995). While attempting to explain the rationale behind the colonial decision to sideline women from public administration and vocational activities at the time they did, Gloria Chukwu argued that the colonial administrators came to Nigeria with western gender stereotype. Their treatment of Nigerian women was based on ideas about “women’s fragility and dependence” (Chuku, 1995). With the above propositions and analysis, it
becomes increasingly clear that it was the colonial policies that systematically relegated and detached women from taking part in political, technical and economic activities.

Against this backdrop, this work posits that a more veritable way of encouraging more women to take part in technical education is to device a means of putting women who are well disposed to the ideals of WITED in the legislative chambers or boardrooms. This will enable them to frame favourable policies that would bring about an influx of more women into technical education.

Accordingly, this paper is partially, a call for more women participation in politics in order to initiate ideas and provide opportunity for interested women to undertake technical and vocational education. This becomes imperative due to the assumption that the involvement of more women in technical, vocational and innovative ventures would aid boosting the economy of Nigeria.

Finally, the work concludes that since women were discouraged from taking part in technical education via unfavourable policies (of the colonial lords), it would take favourable policies to ensure their restoration in technical and vocational ventures. It maintains that the need to bring more women into technical education is imperative in view of the huge gap between male and female gender in technical education viz-a-viz the need to empower more women due to their indubitable economic value to the national economy. In this instance, the involvement and contribution of women to the economy of Rwanda remains a reference point.

2. CONCEPTUAL CLARIFICATION

For clarification and in-depth understanding of the subject and the direction of this research, it is important to conceptualise the term, politics which remains a key term in the topic under consideration. Equally, the concept of technical education will be explained and analysed in line with the assumption of this research work with a particular focus on the Nigerian society.

Thus, Elone J. Nwabuzor and Martha Mueller defined politics as a struggle over the distribution of scarce resources by decision-makers in any social group. The social group may be as small as a family or a club; it may be as large as a public corporation, an army or the state apparatus of any given country. This ubiquitous nature of politics has been noted by many who (sometimes condemingly) refer to their rivals in social groups as ‘politicking’ either for certain benefits, or for the avoidance of certain costs or obligations (Nwabuzor & et’al, 1985). The above definition of politics as a struggle among different groups over the distribution of scarce resources for the benefit of the public is instructive given this research assumption for a number of reasons. First, it reveals that in every given society, there is the tendency to struggle for scarce resources. The resources in this context, is the opportunity for more women in technical education. Second, it purports to explain that until one struggles for the available resources, they are not accessible. This clearly validates the need for women to struggle by participating in politics which could reposition them to access the available resources. Third, it shows that the distribution of scarce resources among the contending forces or groups is a function of existing policies. This aspect validates the research assumption that the thriving of WITED ideals could be facilitated when there are favourable policies.

In the light of the above, Harold D. Lasswell defines politics as being concerned with ‘who gets what, when, how’ (Lasswell, 1936). This fundamental political question partly captures the concept of politics as used in the research topic. It should be stressed that the question of who get what, when and how in any organized society like Nigeria, can be satisfactorily answered by existing policies which define what is due to what group, when and how.

In the same vein, Easton defines politics as a system of interaction in any society through which binding or authoritative allocations are made (Easton, 1969). Drawing from this definition, one of the fundamental questions is, to what extent are women involved in the interaction of their society through which binding or authoritative allocations of resources are made?

Arguably, the collective definitions of politics as stated above has helped in substantiating the concept of politics as used in the context of the research topic, though with limitations on their parts. Nonetheless, they have assisted in shedding light on the concept of politics generally, and has equally aided in shaping our focus.

On the other hand, according to Technical Instruction Act of 1889, the expression, ‘technical education’ shall mean instruction in the principles of science and art applicable to industries, and in the application of special branches of science and art to specific industries or employments. Samuelson stated in 1890 that technical education was ‘everything which prepares a man and woman for work he or she intends to pursue’. Millis stated in 1925 that ‘the objectives of technical education were to provide instruction in the principles of art and science
applicable to industry and in the application of special branches of art and science to specific industries and employment’.

From the above explanations, it becomes clear that technical education is a branch of education (either art or science) that involves acquiring skills and vocations as it relates to industries and employment for self-sufficiency. This clarification indicates that the applicability of the kind of education under discussion to industries, generation of employments and actual contributions to national economy as well as individual economic empowerment is more important than mere theories. Indeed, it shows that while it is not out of place to study theories and formulae of courses of instructions that constitute technical education, the actual acquisition of basic skills and vocations that are relevant to industries and employment generations is of paramount interest.

Interestingly, the Polytechnic sub-sector was created to provide manpower in technical education. Perhaps, this is the factor that provides justification for the rooting of WITED in the Polytechnics sub-sector.

3. EVOLUTION OF WITED: HISTORICAL PERSPECTIVES

Women constitute a technical, intellectual and moral factor of undoubted value, and thus we see them feature in the fields of science, art and of politics, excelling with extraordinary ease, with the supreme majesty of their moral vigour and by the irresistible force of their feminine charms (Morton, 1962).

Although, the concept of WITED (i.e. Women in Technical Education and Employment (WITED) was coined in 1988, a study of African women activities from the earliest period reveals that African women have been participating in technical, vocational and innovative ventures at informal levels. For instance, it is on record that African women were deeply into technical engagements such as weaving of baskets and cloths, making of clay pots, local beer-brewing, mining, manufacturing, among other artistic works. Undoubtedly, this provided impetus for the springing up of local industries with attendant employments for both male and female gender during the pre-colonial era.

The above assertion suggests that women, among other fields of endeavours, are proven principal actors in technical activities from the time immemorial. Admittedly, African societies in the pre-colonial era did not have a refined education system compared to what is obtained today. Nevertheless, the involvement of women in technical ventures can neither be undermined nor over-emphasized. Consequently, scholars of African origin have argued that women in the period under review played notables roles in governance, economy, military and socio-cultural spheres. In line with this argument, Bolanle Awe opined that during the period under consideration, some women were the ‘saviours of their societies’ due to their technical skills that impacted positively on the economy of their various communities (Awe, 2001).

In the light of this, Eno Blankson averred that the role of women in traditional African economy was enormous. From time immemorial, the business of production/manufacturing had engaged the attention of women in various parts of Africa. It was also not uncommon to find women both in production, manufacturing and exchange of goods in market places. For instance, In Benin kingdom, women were deeply involved in agriculture, which is implicitly technically inclined, and had slaves who worked in their farms (Blankson, 2009). Similarly, Niara Sudarkasa’s survey on the Yoruba women showed that women were farmers, traders and craft producers in the pre-colonial period. Women employed their time in shelling the kernel from the palm nuts and sometimes tending poultry and livestock for the market. They also engaged in palm oil making, nut oil production from the kernels of palm nuts as well as shear butter for the industries (Sudarkasa, 1973).

Another technical and industrial venture that enjoyed the attention of women during the period under focus was beer-brewing from guinea corn or maize as a refreshing drink for the household, visitors and commercial purposes. An empirical study of indigenous economy of Africa in the pre-colonial period reveals that women, particularly, Nigerian women were into the production of different brands of drinks for various reasons, including domestic, festivals, commercial and even rituals. For example, Buganda women specialized in the production of local gin similar to the gin produced in the Niger Delta of Urhobo and Itsekiri kingdoms. Against the Eurocentric perception that there was a transferred technology of liquor into Africa, it was discovered that there was an indigenous production of liquor in Africa especially in the coastal communities of East Africa and the Niger-Delta region before the advent of the European invaders. The women of Kalabari and Andoni were
also involved in local gin production. The European attempt to forestall the transfer of this technology to other parts of Nigeria and Africa prompted them to label it ‘illicit commodity’ as it was a form of currency (liquor or spirits) in parts of African societies during the period (Nzemeka, 2009).

The Hausa women were not left out in the area of technical or vocational activities. For instance, the Hausa women involved in the production and sale of refreshing milk drinks called \textit{fura dinumun} and milk yoghurt. Other drinks were processed from millet and guinea corns as \textit{kunnu drink} and when fermented was used in the processing of local beer called \textit{burukutu} (Nzemeka, 2009). However, the level of Hausa women in technical and vocational activities was drastically reduced following the introduction and embracement of Islamic religion which clearly negated the idea of women appearance in public for such engagements. Among the Igboos, V. C. Uchendu argued that women were deeply involved in the production of palm oil, weaving of baskets and cloths among other agricultural activities. The Igbo women were equally into making of pottery objects and were in command of the resources and skills necessary for the production of wooden and earthen wares or materials (Uchendu, 1965). It was also recorded that in other parts of Africa, particularly in Uganda, women combined farming and building constructions during the period in question (Kiwanuka, 1971). The Tiv and Idoma women like others in the old Kwararafa kingdom were said to be involved in the weaving of native wares, making of different kinds of clay plates and pots as well as thatch roofs among others.

Generally, Nigerian women in the pre-colonial era were not only actively involved in technical and industrial activities, they were also innovative and creative in driving the local industries. For instance, in the old Kanem Bornu Empire, Magira Aisa Kuli who acted as the regent in the said Empire between 1562 and 1569 initiated local irrigation methods to boost the agricultural activities and food production (Blankson, 1997). In like manner, in the history of Benin Empire, there was a woman who was said to have contributed immensely to the food culture and cookery art of the Empire and was deified in Bini tradition (Nzemeka, 2009). The contribution of women was also visible in mining and manufacturing. In the traditional societies of Ile-Ife and Benin Kingdom, women were into copper and tin mining as well as bronze casting.

Thus, it has been well established that women actually dominated the technical departments of the local industries of their various communities during the pre-colonial era. Equally, the women dominated the medical aspect as it relates to health, healing, baby-delivery, among others. Although, these were done ‘informally’ or auxiliary and therefore, did not involve the use formulae like the western education style, they are undoubtedly practically technical.

Unfortunately, despite the huge involvement of women in technical activities during the pre-colonial period, not much has been written concerning it. This constitutes a challenge to women scholars who may wish to review women activities in the past in order to be adequately guided on how women have evolved over time with a view to providing creditable direction for the future. Consequently, Eno Blankson asserted that there have been concerns about how to redeem the silence on the female gender in traditional historical writings. These writings were usually not gender conscious. Thus, historical events were narrated as if women were not in existence, not even as victims (Blankson, 2009).

On the other hand, despite the huge involvement of women in technical activities during the pre-colonial period as revealed above, it was conspicuously observed that there was a downturn in this area during the colonial period. Indisputably, the colonial administration is clearly contemporaneous with the dwindling participation of women in technical and vocational activities. This position has been validated by the proposition of Gloria Chuku when she asserted that women did not benefit much from the colonial administration, especially in relation to what they contributed to the system. They (women) did not receive any encouragement or support in terms of trainings to acquire new technical skills from the colonial government like their men counterpart (Chuku, 1995). It was in reaction against this trend among others, that there was Aba Women Riot in 1929.

In the same vein, the Christian missionaries also advocated the colonial policy of relinquishing women from political, social and economic pursuits. Though the Christian missionaries imparted western education on girls and initiated the practice of sending girls to school yet, followed different curriculum for boys and girls. For instance, in missionary schools and special training centres that dispensed academic courses, the girls were taught domestic science, European’s women skills and etiquette and the Bible in vernacular languages. In fact, it was the Christian missionaries who controlled the western educational system that transmitted perhaps, unwittingly and unconsciously, female inferiority and served discrimination in Nigerian economic and political affairs as a part of Western civilization which lowered the social status of women at that time (Uchendu, 1965).

In the early decades of colonial rule, the missionary centres also trained girls for Christian wifehood and motherhood but not for modern day employment whereas the boys were given technical instructions so as to equip them for transport and mining industry, clerical jobs in native courts, colonial offices and trading companies (Uchendu, 1965). Perceptively, Hafkin and Bay observed that:

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Missionaries were not necessarily against women participation in politics; clergies in England could be found supporting women’s suffrage in America but in Africa, their concern was the Church and for the needed Christian families. Therefore, Christian wives and mothers not female political leaders and technical instructors were the missions’ aim. As Mary Slessor, the influential Calabar missionary, said: “God- like motherhood is the finest sphere for the women, and the way to the redemption of the world”. As the English language and other knowledge of “book” became necessary to political life, women were increasingly cut out and policy making became less public (Hafkin & Bay, 1982).

It is in the light of the preceding arguments that it was pointed out that the colonial era could be considered the most uneventful period in the area of women participation and representation in politics, economic and technical departments despite the fact that there were records of women’s resistances.

Indisputably, every altercation modifies the existing patterns of society. In this instance, the colonial political arrangement proved to be prejudicial to women even in the economic and technical domains. Therefore, it should be mentioned that the European intrusion caused the erosion of women’s technical and economic contributions. The dimension, expansion and nature of trade during the colonial era which is the interest of the ‘mother country’ resulted in diminishing the importance of women in all spheres. Consequently, colonialism fostered sex based stratification of economy by initiating young men to take over trading and manufacturing bastions previously held by women. This structure which had been maintained even after the colonial period, depicts an unfairness and injustice against women due to their relegation to the background hence, the urgent need for restructuring towards an enduring and equitable gender-balanced arrangement for the purpose of promoting women and engendering sustainable development.

In an attempt to avert this trend following Nigerian independence, and in pursuant of relevant positions in all sectors, women have over time organized themselves into different groups in order to be more formidable in their fight to seek for more opportunities towards a balanced society. For example, WIMBIZ – Women in Management, Business and Public Service CEO/Policymakers, STEM – Women in Science, Technology, Engineering and Mathematics, among other feministic-inclined organizations.

In this wise, it is believed that the creation of WITED is partially a response to the perceived imbalance between men and women in technical education.

4. POLITICS AS A VERITABLE TOOL FOR PROMOTING WITED IDEALS

The participation of women in politics is of strategic importance not only for women empowerment, but because it has governance and wider benefits and impact (Olojede, 1999).

The above assertion is a declaration of the British Council Gender; a feminist organization that seeks for improved empowerment of female gender. In the light of this, scholars have argued emphatically that the development of any country requires the participation of both men and women. In this instance, equal opportunities for both men and women in technical and vocational education which the colonial administration ignored without apology is of great importance. In fact, there is a global recognition that gender equality in all ramifications of life is a fundamental aspect of modern democratic governance. It is expected that both men and women should have equal rights and opportunities to participate fully in all aspects and at all levels of socio-political, economic and academic activities. But in practice, women faced challenges and the number of women in leadership and decision-making positions is abysmally low. Meanwhile, it has been proven that countries with increased women’s participation in politics and leadership positions tend to be more inclusive, egalitarian and democratic. Hence, they tend to develop faster than others due to their conscious efforts to tap into the potentials of women in the governance process. Similarly, Business executives have maintained that Nigeria stands to gain economically if women are encouraged to participate more in the decision making process in corporate environment and in the legislature. This constitutes part of the perception that women all over the world are catalysts for development and change.

Thus, canvassing for support for gender equality is not just a consequence of democratization, but also a part of a broad cultural change that is transforming industrialized and developing societies and bringing growing mass demand for increased democratic institutions. Even though, the legal contest and academic debate between masculinity and feminism is undeniable, a more objective position tends to admit that women have been
marginalized, hence the need for them have a common front to interrogate the status-quo. Apparently, WITED have emerged to challenge the said status-quo and ensure that more women are given opportunities to get involved in technical education. However, the extent in which success can be achieved in this area largely depends on their readiness to take active part in politics.

In any organized democratic society, politics is the launching pad into power and other sensitive positions. It is therefore impossible to access power and positions of authority to initiate, formulate, implement and enforce policies outside politics. Hence, the criticality of politics to creating the enabling environment and drive the ideals of WITED. Consequent upon the seemingly non-participation of women in politics, men have continued to occupy all the available space to the detriment of their women counterparts.

It is against this backdrop that Abiola Akiode-Afolabi pointed out that it is questionable that it is only or majorly men that are formulating policies and taking decisions on issues that affect both men and women. Perceptively, politics and political arrangement in Nigeria has undermined female legitimacy resulting in women’s political powerlessness. Statistically, women’s overall political representation and participation in government is less than 7% in Nigeria (Akiode-Afolabi, 2013). As a result, nothing is done to change this unbalanced structure. It is likely that this narrative will remain unchanged if women do not rise to take their destinies in their own hands. Understandably, the definition of politics as a struggle for scarce resources posit that women should struggle for power by getting involved in politics in order to achieve set goals. Thus, WITED as a body should vigorously participate in politics (at national or local levels) and continue to link up with women politicians to sell their ideas. For instance, a policy of gender equality in the admission of candidates into academic departments that constitute technical education will go a long way to help WITED achieve her aims and objectives of getting more women into technical education.

Thus, the call for women active participation in politics includes but not limited to national politics. Women could take active part in the politics of their immediate environments. For instance, the newly signed Polytechnic Act stipulates that the Deans and Heads of Department should be elected and not appointed. This provision provides opportunity for women (female staff of all Polytechnics) to develop their political capacity by networking with each other in order to take advantage of this innovation and elect more women into the positions of Deans and Heads of Department. This is particularly important in view of the abysmal statistics against female gender with regard to the office of the Rector, Deputy Rector, Registrar, Deans and Heads of Department in the Polytechnic sub-sector viz-a-viz the female students in technical departments. It is instructive in this wise, to state that WITED should develop itself into a strong political force and elect her members who are well disposed to her ideals rather than just being gender sensitive. This will enable them to challenge the present status-quo and alter the narrative in favour of women.

It must be mentioned emphatically that it was in appreciation of the political factor (i.e. active participation of women in politics or act of establishing a robust relationship with female politicians) in driving the ideals of ‘TechWomen Program’ – an initiative of the United States Department of State’s Bureau of Education and Cultural Affairs that its leaders visited Nigeria (Lagos and Abuja) between 18th and 23rd March, 2018 respectively to mentor young women and girls to spark their interest in Science, Technology, Engineering and Mathematics (STEM) fields. This was effectively carried out by collaborating with some prominent Nigerian women (politicians) such as Senator Binta Masi Garba. At the plenary session, Senator Binta Masi Garba while stressing the need to initiate favourable policies that would encourage more girls to study Science, Technology, Engineering and Mathematics, lamented over poor representation of women in politics when she stated that there are only six (6) women senators out of one hundred and nine (109) senators in the Upper Chamber of National Assembly (i.e. 8th National Assembly). However, after the 2019 general elections, the number of female senators is seven (7) out of the total of one hundred and nine (109) available seats. The number of female members of the House of Representatives dropped from nineteen (19) to eleven (11) out of the available three hundred and sixty (360) seats. In like manner, there were only had six (6) female cabinet members, out of thirty-seven (37) during the first tenure of Buhari’s administration. This is constitutes a huge challenge for women in terms of statistics viz-a-viz the struggle for available resources and favourable policies for women.

Therefore, it should be emphasized that the call for more Women in Technical Education and Employment would gain the desired credibility if women find their way into politics which is the basis for accessing power.

5. CONCLUSIONS

Apparently, from the preceding arguments, women in the various areas that constitute the present day Nigeria dominated technical and vocational departments during the pre-colonial era. However, the intrusion and commencement of colonial administration with its attendant unfavourable policies utterly altered the narratives.

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Unfortunately, this was upheld by the successive administrations after Nigerian independence, hence the gender disparity as observed in the technical education today.

In the wake of this understanding, WITED and other NGOs have emerged to challenge the status-quo and attempt to bring about gender balance in technical education with approximate equality. In particular, the efforts of WITED in this regard should be applauded on the premise that tapping into the potentials of women is sine qua non to putting Nigeria on the path of meaningful development.

However, this paper maintains that making a fundamental breakthrough in gender evenness in technical education is a matter of policy via participation in politics. Accordingly, the breaking away of women from the stereotype of political apathy and their actual involvement in politics which is the launch pad into power where favourable policies could be made and implemented constitutes an acid test of their resolve to promoting the basic ideals of WITED. In other words, women absence or scantiness in the corridors of power suggests lack of seriousness of intention towards resolving gender disparity, particularly more women enrolment into technical education. Alternatively, the paper opines that WITED should initiate a robust relationship with women in power to sell her objectives and crave for such policies that would provide wide opportunities for females in technical education.

Finally, in the face of the increasing excruciating economic hardship in which women and children are most vulnerable, any policy or effort that would encourage women to take part in technical and vocational ventures would be an escape route out of impoverishment.

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ABSTRACT

The place of women in the society cannot be trivialized. Several women have contributed their quotas, to national growth, socio-economic advancement and technological development globally. In Nigeria in particular, there exist distinguished women who have worked assiduously in rebranding and uplifting Nigeria. From the perspective of discourse analysis, this work critically examines language use in selected speeches of women entrepreneurs in Nigeria with a view to revealing how their use of language is connected to their achievement in promoting and aiding Nigeria’s development during their regimes and services to the nation. The data comprised two selected speeches of Professor Ngozi Okonjo-Iweala (a former minister for finance and foreign affairs in Nigeria) and Mrs. Folorunso Alakija (the Africa’s richest women rated by Forbes, 2012). It uses insights from M.A.K Halliday’s Systemic Functional Linguistics to analyse the transcribed data at three linguistic levels – lexical, grammatical and discoursal. The findings revealed that through the frequent and consistent use of the first person plural pronouns e.g. “we”, “our”, “us”, the women collectivise actions and subscribe to inclusion of everyone in working towards the new Nigerian agenda while the lexical items, “revamping”, “improved”, “environmental safeguard”, “youth empowerment”, “technology”, “innovations” e.t.c. show that they are interested in nation building for economic growth in Nigeria in such that younger generation women can follow suit to bring out a better Nigeria. The study therefore concludes that women should rise up and take bold steps in educating and enlightening themselves on the task ahead to move our nation to the next level in achieving the set millennium goals.

Keywords: Discourse analysis, language use, speeches, women, Entrepreneurs

INTRODUCTION

“A lizard that jumped from high Iroko tree without falling said he would praise himself if nobody does”. (Achebe 1958: p. 21)

With the changing world and experiences globally, the roles of women had also changed from the traditional roles of kitchen and housewife (Fapounda, 2010). Researches and observable samples have provided this in our present world looking at the statistics and performances of women in various feeds of endeavours contributing to and applying their academic or skill acquired to solve humanitarian problems.

Several of these women had been announced and some unannounced. But as the proverbial expression states that “many daughters have done virtuously but thou excellent them all”.

This study is a discourse analysis of speeches of two women. This study also identified and described the linguistic and extra linguistic features that proved that African and Nigeria women in particular have a large hearts and are concerned about the technological and economic growth of our dear nation on issues bothering women and youths most especially the first speech of Mrs. NgoziIweala (former minister of finance and foreign minister of Nigeria). She was a former Deputy Director of World Bank and current Independent Director of Twitter, Inc. The speech contains her concerns about the banks of Afghanistan which was on the verge of collapsing and how the economic downtown afflicting the country can be revived. The second speech is by Mrs. FolorunsoAlakija as earlier indicted, she is the richest woman in Africa rated by Forbes organization (2015) without attending any University. Her focus was and is still presently on empowering Nigerian youths to equip graduate and undergraduates, job seekers, working class and self employed youths in Nigeria with the knowledge and skills they need to support their families and become part of the successful in the society in entrepreneurship and innovation in Nigeria. In her words quoting from her speech after welcoming their participants on the 4th edition of her youths empowerment programmes organized for Nigerian youths, she said:

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"Our goal is to empower the Nigerian Youths to enable them to achieve their individual potentials and contribute to the economy while also reducing vices in our society".

1.1 Objectives of this Study

The main aim of this study was to examine the language use of selected speeches of women from the perspectives of discourse analysis who had contributed to the growth of our nation in various fields of endeavours, most especially in technology and entrepreneurship skills despite their feminine nature and many duties as wives at home. In addition, the study examined how the speeches of these women are connected to their achievements in promoting Nigeria image both national and internationally.

The specific objectives are:

1. Explore and reveal the outstanding characteristics and achievement of our women for rising above their roots amidst many challenges facing women in the society.
2. Analyse and discuss their speeches that backup their actions that from their hearts they love and desire a better society and they are ready to support our men in their bids and efforts towards moving the nation forward by contributing their quotas.
3. Promote these women as role models to younger generation of women following after them, that if God can help these women to excel and be outstanding in their tenure of offices, they also can do better later in life in their various fields of endeavours and be blessings to the society.

2 LITERATURE REVIEW

Several scholars had carried out studies on women and their contributions to national development, technological growth and economic development of nations at local and at the international scenes.

Suleiman, Sikiru and Jimoh (2012) examined the challenges and contributions of women to the NIGERIAN economy and the strategy for achieving the millennium developmental goal;

(MDGs) at Utara University Malaysia and University of Technology Adamawa State, Nigeria from 2001–2007. They concluded that if women are empowered, they can perform better than their present position in the world and that educating females is not a waste as some men count it in the society. They supported the Beijing Women Conference held in September 4th – 5th, 1995 country as a good starting point.

Alutu and Audu (2009) examined female participation in information communication and technological development in Nigeria and the implication for early career guidance from the University of Benin Edo State Nigeria. The paper encouraged the Nigerian government to start education of females in ICT at an early stage. Their research was carried out on a cross section of working class women in various establishments in Benin City. Their study revealed that there is need to develop a training programme for the interested women and enlightenment seminars for their women which will in turn ensure improved technological development in Nigeria. They enjoin the Nigerian government on education as stated in the national policy on education so as on education regarding introducing Information on Communication (ICT) into the Nigeria school system at the primary level of education so that these Nigeria female children can cope with their international counterpart at the international level learning in school life since it is a new technology.

Umar and Bakare (2018) research on barriers to Women participation in Information society in Nigeria from Open University of Nigeria. The study revealed that among issues such as socio-cultural and economic problems, religion and culture are denying Nigerian women from participating well in the information technology balance and the danger of such weakness may hinder them from knowing international languages that dominate the web. The study concluded that women house to be fully engaging in the use of interact so that they can also participate and contribute their inclusion in shopping the information society most especially northern part of Nigerian women Fapounda women.

2.1 Theoretical framework

The theoretical framework for this study is Hallidays (1994), metafunctions of language are three broad functional levels of languages. These are the ideational, interpersonal and textual function. “Language is an instrument of communication among human beings. They interact through language by talking to one another. This talk is termed “discourse” and its organizational structure has to be accounted for and studied, hence discourse analysis, meanings emanate from such talks and these meanings have to be analyzed, hence semantics
Degbro, O. D. (2009). But for this work we shall discuss features of speech acts, contexts word-level grammar of linguistic feature.

3 ANALYSIS OF THE SPEECHES

In understanding of the speech of Professor Ngozi Okonjo-Iweala and Mrs. Folorunso Alakija one has to start with the choices of their language features at the various linguistic and discoursal levels. We shall start with the linguistic level.

4 LEXICO-SEMANTIC AND GRAMATICAL LEVELS

From the choice of words of the two women, we observed lexical items such as symbolic, desire, reshaping, future partner, equip, youth, just to mention a few. That these women meant the development of their nation and are determined to take up issues concerning their addresses to the next level for self and national growth and development.

The second observable linguistic marker and language use that makes their speeches relevant to national development and love for people is their use of collective pronoun “We” and personal pronoun “I” spread over nearly all the paragraphs contained in the speech. Samples are:

“…. ‘I’ welcome you”.

To begin by paragraphs one and at the opening part of the speech. ‘We’ are having this information in verbal.

“All of us who have been in government…” – Professor Ngozi Okonjo-Iweala

“We should ‘support’ ………” – Professor Ngozi Okonjo-Iweala

“‘Our’ own account…………..” – Mrs. Folorunso Alakija

“Our target” – Mrs. Folorunso Alakija

All the ways these speakers express themselves by the use of these pronouns in discourse indicate that these speakers aligned with the hopes and aspirations of the society and see themselves as the part of the society to solve the problems together and move the nation forward.

This frequent use of ‘I’ and ‘We’ shows that our women are strong and willing to work together with people for the progress of the country.

4.1 Discoursal Level

At the discoursal level, there are many acts observed in these texts proving that the women speeches examined in this paper are performing and still putting efforts to see that our society is technologically advanced and entrepreneurially skilled. Performative words, sentences and utterances according to (Austin, 1962:6) are action performing languages.

The term ‘performative’ will be used in a variety of cognate ways and constructions, much as the term ‘imperative ‘is. The name is derived of course, from ‘perform’, the usual verb with noun “action”: it indicates that the issuing of the utterance is the performing of an action.”

Also observed are the informative acts by the women showing that apart from the teaching skills obtained by their listeners to imbibe positive attitude towards our national development through their speeches informative acts are abound to inform participants in the conference of new ideas, innovations, skills and techniques. Samples of informative acts in their speeches are:

…As a former Finance and Foreign Minister in Nigeria, I know that development is measured not in months but in years and even in decades …

……Young people can offer the much needed human capita l to speed up economic growth and foster sustainability of any country…..

……In Nigeria today the youths have a wrong notion of the ‘get rich quick syndrome’
The World Bank is here for the long haul, but this commitment comes with clear expectations that a more selective and achievable set of benchmarks will be measured and monitored.

All the above linguistic expressions by these women are Rhetorical Strategies” that are used to coerce and persuade listeners in these conferences which may later in life yield positive results. This is in line with M.A.K. Halliday’s theory of metafunctions of language (1994) and (2004) that language performs functions of given idea, interacting with others and social emphatic purposes to form good relationships and textual purposes meant for future references.

To Brown and Yule (1983) definition of discourse “the analysis of discourse is necessarily the analysis of language in use”.

Also, Simchair and Coulthard (1975); Coulthard (1977) which defined discourse analysis as the study of language in use. Stubbs (1995:1) said that language is used in terms of social contexts in particular with interactions or dialogue between speakers. These are to support the motion or the idea that our women are performing and acting through their language use in the society. People are encouraged to take steps and move forward to the next level in any area of lives endeavour using rhetorical samples, this is in accordance with John Austin and John Searle philosophers, both of who believed that language is used not just to describe the words but to perform a range of other actions that can be indicated in the production of the utterance itself.

Samples are;

“I encourage you to give this life-changing programme all the seriousness it requires...”

“Get involved...”

“I also commend all the staff of the Foundation for their hardworking and commitment to the cause of this programme”

“Thank you Mr. Chairman for the opportunity to address this conference...”

“God bless you all...”

From the excerpts highlighted above, we can observe that language use in these expression can motivate the listeners and move them forward and that there is still hope for the future, for an adage says; “when there is life, there is hope”.

5 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This paper has examined language use of selected speeches of two women who had excelled and distinguish themselves among other women in the society from the perspective of discourse analysis.

And as seen in the study, these women had skillfully manipulated language and its rhetoric and discoursal resources to speak to their listeners and participants at the conferences they were invited of the need for our society to rise up and take bold steps in educating and enlightening themselves most especially our youths and women to the task ahead to move our nation towards achieving the millennium goal and move us from the developing or underdeveloped country as rated by transparency international to be developed.

It concludes that speeches in conferences, meetings, e.t.c are tools of informatives, directives, elicitives that promote unity, harmony, interrelationships between language and the society for progress and economic development and confirmed the theory of M.A.K. Halliday’s metafunctions of language and Adegbija’s layers of meaning that language put in use by women can yield laudable progress for our economic growth and technological advancement.
5.2 Recommendations

This study therefore recommends that this type of women conference as organized by the WITED of Federal Polytechnic Ilaro Chapter should continue among women in all tertiary institution in Nigeria for enlightenment and reawakening of our women to their responsibilities in this age of internet.

More infrastructures should be provided to our women for better educational in computer and internet training to catch up with the present global women and not to be left behind in the use and benefits of the internet for profitability and in their businesses and entrepreneurial skills.

Our young women should borrow a leaf from the life of the women discussed in this study as role models that they also by God’s grace can become achievers in their various fields of endeavours and leave a positive legacy behind for younger generations.

Lastly, our government should fund and encourage women educational system by increasing the present allocation to women and female education in Nigeria for a better access to the internet so that our women can favourably compete with their other women counterparts in the global landscape and relevant as part of nation’s builders and not only in the kitchen and as housewives.

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MITIGATING THE RISK OF BREAST CANCER THROUGH EARLY PREDICTION AND DIAGNOSIS USING MACHINE LEARNING ALGORITHMS

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ABSTRACT
Breast cancer (BC) is one of the most common cancers among women worldwide and is the second leading cause of death after lung cancer according to global statistics. The early diagnosis of BC can improve the prognosis and chance of survival significantly, as it can promote timely clinical treatment to patients. The major challenge in cancer diagnosis is the number of patients who are incorrectly diagnosed. Further accurate classification of benign tumors can prevent patients undergoing unnecessary treatments. Thus, the correct diagnosis of BC and classification of patients into malignant or benign groups is the subject of much research. As a result of its unique advantages in critical features detection from complex BC datasets, machine learning is widely recognized as the methodology of choice in BC pattern classification and forecast modelling. In this paper, a performance comparison between different machine learning algorithms: Support Vector Machine (SVM), KNN, logistic Regression, Decision Trees and Random Forest is conducted on the Wisconsin breast cancer dataset obtained from the UCI machine learning repository which is the benchmark dataset for comparing the results through different algorithms. The main objective is to fully assess the correctness in classifying data with respect to efficiency and effectiveness of each algorithm in terms of accuracy, precision and recall. Experimental results reveal that SVM gives the highest accuracy (97%) with lowest error rate making it the most germane algorithm for BC prediction. All experiments are executed within a simulation environment and conducted using the Eclipse PyDev IDE and Python Sci-kit learn.

KEYWORDS: Breast Cancer, SVM, Classification, Benign, Malignant

1. INTRODUCTION
In both developed and developing countries, cancer is a major public health problem. Recent statistics from globally acclaimed leading health organizations reports that breast cancer is the most common cancer in women and is the second leading cause of death among women after lung cancer. (Siegel, Miller, & Jemal, 2019). In Nigeria, according to WHO (2014) cancer country profile, breast cancer constitutes about 34.2% of the total cancer mortality in women while prostate cancer is more prevalent in men and constitutes about 31.7% of the total death in the male populace. As at 2016, hundred thousand (100,000) new cases of breast cancer deaths were recorded annually (Punch, 2016).

An International Agency for research on cancer and a sub-agency of the WHO, the Global Cancer Observatory, Globocan (2019) reported 37.0% breast cancer death cases which is a significant 2.8% increase from the breast cancer statistics recorded in the year 2014. However, the prostate cancer prevalent in the male populace witnessed a significant decrease from 31.7% to 29.1%. Globally, the rising breast cancer incidence and mortality represent a significant and growing threat for the developing world. Cancer begins in cells, the building blocks that make up all tissues and organs of the body, including the breast. Tumors in the breast can be benign (non-cancerous) or malignant (cancerous). Benign tumors are usually not harmful. Malignant tumors are usually more threatening, can invade nearby organs and tissues, can spread to other parts of the body, and can be removed but usually grow back (Chaurasia & Pal, 2017). There are several risk factors for breast cancer including female sex, obesity, lack of physical exercise, drinking alcohol, hormone replacement therapy during menopause, ionizing radiation, early age at first menstruation, having children late or not at all, and older age. With early diagnosis and detection of Breast cancer, women stand a higher chance of survival since adequate treatment can be prescribed to the affected individuals but sadly most of cancer events are diagnosed in the last stage of the illness. Consequently, this necessitates sophisticated techniques for accurate and early diagnosis of breast cancer.

Data mining and machine learning techniques over the past few decades have been widely used in intelligent healthcare systems and have proven to be ideal for accurate diagnosis and prognosis of breast cancer. Traditionally the diagnostic accuracy of a patient depends on a physician’s experience (Meesad & Yen, 2003).
However, this expertise is built up over many years of observations of different patients’ symptoms and confirmed diagnoses. Even then the accuracy still cannot be guaranteed. With the advent of computing technologies, it is now relatively easy to acquire and store a lot of data, for example the dedicated databases of electronic patient records (Pavlopoulos & Delopoulos, 1999). Therefore, it would be very useful to have an accurate system that can sift through large volume of medical data to aid in decision making of medical personnel including early detection and prevention which would increase the survival rates for breast cancer.

Lately, machine learning techniques are playing a significant role in the diagnosis and prognosis of breast cancer by applying classification techniques to distinguish benign from malignant tumors and identify people with breast cancer. In this study, several machine learning algorithm namely: SVM, k-NN, decision trees, logistic regression and random forest were implemented on the Wisconsin Breast Cancer datasets (WBCD) to determine the best prediction classifier to be applied for early breast cancer detection, thus provoking earlier diagnosis, treatment, and survival in cancer diagnosed patients.

The aim of this research is to empirically compare the performance and evaluate the efficiency and effectiveness of several classifiers with respect to accuracy, precision and recall to determine the best classifier for detecting breast cancer.

This remainder of this paper is organized as follows; Section 2 describes related works in the field of breast cancer prediction. Section 3 describes the experimental methodology including the imputation process and the experimental process. Section 4 present the experimental results. Finally, Section 5 concludes the research with a future scope.

2. RELATED WORK
Classification is a data mining technique which involves the use of supervised machine learning techniques which assigns labels or classes to different objects and groups. Many machine techniques have been applied by researchers in solving this classification problem. In the following sections, a comprehensive review of different classification methods applied to breast cancer will be given.

Sumbaly et al. (2014) have discussed j48 decision tree classification algorithm for breast cancer diagnosis along with the summarization on the types of breast cancer, risk factors, disease symptoms and treatment. The authors have proven that the j48 algorithm is able to produce 94.5% of accuracy with correctly classified instances and have also suggested that neural network and digital mammography would be the alternative approaches for breast cancer prediction.

Williams et al. (2015) focused on two data mining techniques namely Naïve Bayes and j48 decision trees to predict breast cancer risks in Nigerian patients. The analysis was made to determine the most efficient and effective model. The authors obtained the dataset from cancer registry of LASUTH, Ikeja in Lagos, Nigeria which contains 69 instances with 17 attributes along with the class label. The dataset holds 11 non-modifiable factors and five modifiable factors. The experiment is conducted through Weka and the authors have claimed j48 decision tree is better for the prediction of breast cancer risks with the values of accuracy (94.2%), precision, recall and error rates.

Asri et al. (2016) attempted to assess the correctness, efficiency and effectiveness of different machine learning algorithms in the prediction of breast cancer in terms of accuracy, precision and recall. Experimental results revealed that Support Vector Machines outperformed other algorithms and gave the highest accuracy, precision and recall with the lowest error rate.

Huang et al. (2017) in their work to predict breast cancer tried to evaluate the performance of single SVM classifiers and SVM classifier ensembles obtained by using different kernel functions and different combination methods. Results obtained revealed that most SVM ensembles based on bagging and boosting performed slightly better than single SVM classifiers on both small and large scale breast cancer datasets.

Yue et al. (2018) tried to solve the issue of acute and early detection, diagnosis and prognosis of breast cancer in women. Several popular machine learning algorithms such as Support Vector Machines (SVM), Decision Trees (DT), Artificial Neural Network (ANN), k-Nearest Neighbor (KNN) were applied to the standard dataset used by most breast cancer researchers i.e. the Wisconsin breast cancer dataset which contains ten attributes. Results obtained shows that to produce very accurate results, machine learning algorithms need to be hybridized with feature selection techniques such as particle swarm optimization technique and so many others.

Khan, Islam, Jan, Din & Rodrigues (2019) proposed a deep learning framework for the detection and classification of breast cancer. They posited that the early detection and classification of breast cancer in the early stages of its development may allow patients to have proper treatment. In the proposed framework,
features from images were extracted using pre-trained CNN architectures, namely, GoogLeNet, Visual Geometry Group Network (VGGNet) and Residual Networks (ResNet), which were then fed into a fully connected layer for classification of malignant and benign cells using average pooling classification. To evaluate the performance of the proposed framework, experiments were performed on standard benchmark data sets. Results shows that the proposed framework outclass all the other deep learning architectures in terms of accuracy in detection and classification of breast tumor in cytology images.

3. METHODOLOGY

3.1 BREAST CANCER DATASET

The Wisconsin Breast Cancer (original) datasets from the UCI Machine Learning Repository is used in this study. Breast-cancer-Wisconsin has 699 instances (Benign: 458 Malignant: 241), 2 classes (65.5% malignant and 34.5% benign), and 11 integer-valued attributes.

Table 1: Wisconsin Breast Cancer Dataset Attributes

<table>
<thead>
<tr>
<th>S/N</th>
<th>Attributes</th>
<th>Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sample Code Number</td>
<td>Id number</td>
</tr>
<tr>
<td>2</td>
<td>Clump Thickness</td>
<td>1-10</td>
</tr>
<tr>
<td>3</td>
<td>Uniformity of Cell Size</td>
<td>1-10</td>
</tr>
<tr>
<td>4</td>
<td>Uniformity of Cell Shape</td>
<td>1-10</td>
</tr>
<tr>
<td>5</td>
<td>Marginal Adhesion</td>
<td>1-10</td>
</tr>
<tr>
<td>6</td>
<td>Single Epithelial Cell Size</td>
<td>1-10</td>
</tr>
<tr>
<td>7</td>
<td>Bare Nuclei</td>
<td>1-10</td>
</tr>
<tr>
<td>8</td>
<td>Bland Chromatin</td>
<td>1-10</td>
</tr>
<tr>
<td>9</td>
<td>Normal Nucleoli</td>
<td>1-10</td>
</tr>
<tr>
<td>10</td>
<td>Mitoses</td>
<td>1-10</td>
</tr>
<tr>
<td>11</td>
<td>Class</td>
<td>2 for Benign, 4 for malignant</td>
</tr>
</tbody>
</table>

(Source: UCI Machine Learning Repository, 2019)

The density plot shown in Figure 1 gives a quick idea of the distribution of each attribute. The density plot shows distribution of each attribute over the corresponding domain value. The peaks of the density plot of each attribute help display where values are concentrated over the interval. As seen in the class attribute, most of the record are concentrated over the benign attribute.
3.2 EXPERIMENT ENVIRONMENT

The Eclipse PyDev, which is a Python IDE for Eclipse used to programming in Python language, was used to integrate all the other implementation tools together into a single workspace. It was chosen because it is open source and it directly supports all the other tools to be used. Also utilized are Sci-kit learn, matplotlib, numpy, pandas library present in the python programming language.

3.3 EXPERIMENTAL PROCEDURE

The first step in the experimental procedure is the preprocessing of the data collected. Preprocessing is a major step for handling secondary data. Secondary data contains incomplete, irrelevant symbols, misspellings, irrelevant records that introduce noise to the machine learning algorithm. Such noisy characteristics frequently affect the performance of most machine learning algorithms. So to prevent this, some pre-processing is applied before feature selection and application of the specific machine learning algorithms.

Next step is to make use of the Sci-kit library present in the Python programming language with Eclipse PyDev which provides various machine learning models whose implementation in code is very easy. To be able to train the various classifiers namely support vector machine, knn, logistic regression, decision trees and random forest, one has to create an instance of the algorithm already present in the Sci-Kit library. The breast cancer dataset would be split using 5 and 10-fold cross validation for training and testing the various classifiers.

After training the various classification models, the models are tested with the test dataset to ascertain their performance. Several metrics will be employed for checking the performance or accuracy of the machine learning algorithms based on true positive rate, false positive rate, precision, recall and F1 score.

Consequently, the algorithm with the optimal performance is selected and used for future classifications.

4. RESULT AND DISCUSSION

In this section, the results of the experimental procedure are reported. Missing values of an attribute was cleaned by filling in the value with average of fields on attribute. To estimate the performance of the classifiers and evaluate them, we apply the 5 and 10-fold cross validation test which is a technique that works by splitting the training sample dataset into several-parts to train the model, and a test set to evaluate it.

In Table 1 below, the effectiveness of five classification algorithm were tested in terms of mean and standard deviation using 10-fold cross validation, time to build and accuracy on both training and testing data. It shows that SVM has the highest mean of 96.5% with decision trees being the lowest. Also, the time to build of SVM is the highest with KNN being the lowest. This can be attributed to the complexity of the optimization problem of the SVM algorithm. The accuracy of training and testing of the classifiers were also obtained with Random
forest with the highest accuracy of training and doing badly in testing and SVM doing best in testing. Also the chart of the mean using both 5 and 10 folds are shown in figure 2 below.

Table 1: Performance of the Classifier

<table>
<thead>
<tr>
<th>Evaluating Parameters</th>
<th>SVM(RBF kernel) Mean(Using 10-fold CV)</th>
<th>KNN(With 5-neighbours) Mean(Using 5-fold CV)</th>
<th>logistic Regression S.D(Using 10-fold CV)</th>
<th>Decision Trees(Tree-Depth 3) S.D(Using 5-fold CV)</th>
<th>Random forest Time to Build</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>96.50%</td>
<td>95.86%</td>
<td>96.28%</td>
<td>93.56%</td>
<td>94.99%</td>
</tr>
<tr>
<td></td>
<td>96.30%</td>
<td>96%</td>
<td>93.57%</td>
<td>96.14%</td>
<td>95.43%</td>
</tr>
<tr>
<td>S.D(RBF kernel) Mean(Using 10-fold CV)</td>
<td>2.82%</td>
<td>4.15%</td>
<td>3.95%</td>
<td>4.70%</td>
<td>5.93%</td>
</tr>
<tr>
<td>S.D(KNN With 5-neighbours) Mean(Using 5-fold CV)</td>
<td>2.63%</td>
<td>3.68%</td>
<td>1.67%</td>
<td>3.45%</td>
<td>4.37%</td>
</tr>
<tr>
<td>S.D(logistic Regression S.D(Using 10-fold CV)</td>
<td>Time to Build</td>
<td>0.78s</td>
<td>0.58s</td>
<td>0.46s</td>
<td>0.61s</td>
</tr>
<tr>
<td>S.D(Decision Trees(Tree-Depth 3) S.D(Using 5-fold CV)</td>
<td>Accuracy on Training</td>
<td>0.965</td>
<td>0.963</td>
<td>0.926</td>
<td>0.926</td>
</tr>
<tr>
<td></td>
<td>Accuracy on Testing</td>
<td>0.996</td>
<td>0.942</td>
<td>0.941</td>
<td>0.973</td>
</tr>
</tbody>
</table>

Figure 3: Mean using 5 and 10 folds cross validation

Figure 4: Time to build Model (secs)
In order to better measure the performance of classifiers, simulation error is also considered in this study. To do so, we evaluate the effectiveness of our classifier in terms of:

- Kappa statistic (KS) as a chance-corrected measure of agreement between the classifications and the true classes,
- Mean Absolute Error (MAE) as how close forecasts or predictions are to the eventual outcomes,

Figure 7 below shows the kappa statistics and mean absolute error values of the different classification algorithm.
From figure 3, we can better see that the chance of having a best classification (0.98 %) with the least warning error rate (0.02) is produced by SVM. Logistic regression has the highest value of error rate which explains the large number of incorrectly classified instances for each algorithm.

Once the predictive model is built, we can check how efficient it is. For that, we compare the accuracy measures based on precision, recall, TP rate and FP rate values for logistics regression (LR), Support Vector Machine (SVM), Na"ive Bayes (NB) and K-Nearest Neighbor (k-NN), Random Forest (RF) as shown in Table 2.

<table>
<thead>
<tr>
<th>TP</th>
<th>FP</th>
<th>Precision</th>
<th>Recall</th>
<th>F1-Score</th>
<th>Class</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVM</td>
<td>0.97</td>
<td>0.03</td>
<td>0.98</td>
<td>0.98</td>
<td>2</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>0.96</td>
<td>0.02</td>
<td>0.97</td>
<td>0.97</td>
<td>4</td>
<td>63</td>
</tr>
<tr>
<td>KNN</td>
<td>0.95</td>
<td>0.04</td>
<td>0.95</td>
<td>0.93</td>
<td>2</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>0.91</td>
<td>0.03</td>
<td>0.88</td>
<td>0.92</td>
<td>4</td>
<td>63</td>
</tr>
<tr>
<td>DT</td>
<td>0.94</td>
<td>0.06</td>
<td>0.95</td>
<td>0.93</td>
<td>2</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>0.92</td>
<td>0.07</td>
<td>0.88</td>
<td>0.92</td>
<td>4</td>
<td>63</td>
</tr>
<tr>
<td>LR</td>
<td>0.93</td>
<td>0.04</td>
<td>0.93</td>
<td>0.92</td>
<td>2</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>0.92</td>
<td>0.04</td>
<td>0.87</td>
<td>0.96</td>
<td>4</td>
<td>63</td>
</tr>
<tr>
<td>RF</td>
<td>0.92</td>
<td>0.03</td>
<td>0.96</td>
<td>0.97</td>
<td>2</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td>0.02</td>
<td>0.95</td>
<td>0.94</td>
<td>4</td>
<td>63</td>
</tr>
</tbody>
</table>

In evaluating efficiency of our algorithms, table 2 shows that SVM and KNN got the highest value (97 % & 95%) respectively of TP for benign class but k-NN. The FP rate is lower when using SVM classifiers (0.03 for benign class and 0.02 for malignant class), and then other algorithms follow: k-NN, LR and NB. From these results, this explain why SVM outperforms other classifiers in all the metrics. To better understand efficiency, Figure 8 shows the ROC curve of the classifiers that better illustrate the power of each classifier. The ROC curve gives a graphical graph that illustrates the performance of different classifiers. From the plot we can easily select optimal models and discard others to best classification.
As shown in figure 3, SVM is the perfect classifier as it begins from the left corner, to straight up to the upper left corner and then to the upper right corner (with ROC of 98%) followed by KNN, then LR and RF and finally DT with ROC of 97%, 95%, 95% and 92% respectively.

Table 3: Confusion Matrix

<table>
<thead>
<tr>
<th></th>
<th>Benign</th>
<th>Malignant</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVM</td>
<td>449</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>193</td>
<td>4</td>
</tr>
<tr>
<td>KNN</td>
<td>444</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>222</td>
<td>4</td>
</tr>
<tr>
<td>DT</td>
<td>442</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>222</td>
<td>4</td>
</tr>
<tr>
<td>LR</td>
<td>422</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>210</td>
<td>4</td>
</tr>
<tr>
<td>RF</td>
<td>449</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>193</td>
<td>4</td>
</tr>
</tbody>
</table>

Figure 8: ROC Curve

To compare actual class and predicted results obtained using confusion matrix as shown Table 3. SVM correctly predicts 642 instances out of 699 instances (449 benign instances that are effectively benign and 193 malignant instance that are actually malignant), and 27 instances incorrectly predicted (19 instance of benign class predicted as malignant and 9 instances of malignant class predicted as benign). That shows why SVM outperforms other classification techniques used with lower error rate value.

5. CONCLUSION AND FUTURE WORK

An important challenge in data mining and machine learning areas is to build accurate and computationally efficient classifiers for Medical applications. In this paper, we applied five prediction models for breast cancer
survivability on two parameters: benign and malignant cancer patients. In this study, we employed five main algorithms: SVM, k-NN, decision trees, logistic regression and random forest on the Wisconsin Breast Cancer datasets (WBCD) containing 699 instances from UCI Machine Learning repository. We tried to compare efficiency and effectiveness of those algorithms in terms of accuracy, precision and recall to find the algorithm with the best classification accuracy. In order to measure the unbiased prediction accuracy of the five models, we used a 10-fold cross validation procedure, that is we divided the dataset into 10 mutually exclusive partitions (k-folds) using a stratified sampling technique. We repeated this process for each of the five prediction models. This provided us with a less biased prediction performance measures to compare the five models. The obtained results indicated that SVM outperformed all other algorithms with a classification accuracy of 97.36%. Although SVM has achieved very high accuracy in WBCD, the development of improved algorithms is still necessary. The SVM as a tool in diagnosis of breast cancer can further be improved to expand its application. It can be used as a backend intelligent mechanism in developing a device that could help doctors in more rapid diagnostics and monitoring of patient’s condition. Positive implications of implementing the future work will involve developing a Graphical User Interface (GUI) for ease of use of the implemented SVM algorithm consequently leading to cost efficiency and resource optimization, improved response time to patients queries, early diagnosis and treatment for those with benign and malignant tumors and ultimately ensuring healthy living amongst women to foster an active workforce that can contribute to the nation’s growing economy.

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TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING AS TOOL FOR CREATING A PRODUCTION-ORIENTED ECONOMY IN NIGERIA

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ABSTRACT

Economic development and growth of any nation largely depend on capability of utilizing resources to meet socio-economic needs with a view to creating jobs and making the economy production centered. This study focuses on TVET and the extent to which it could facilitate the creation of production-oriented economy. The study was carried out in Ogun State and two polytechnics were covered – The Federal Polytechnic Ilaro and Moshood Abiola Polytechnic, Abeokuta, Ogun State. 100 lecturers of technical and vocational courses in the polytechnics were randomly selected as the sample. Two research questions were raised and a questionnaire of four-point Likert type scale was used for data collection. Data collected were analyzed with frequency and mean. The results indicate high mean values for the efficacy of TVET in creating a production-oriented economy in Nigeria through effective skill acquisition and productive engagement of people especially the youths. It was therefore concluded that Technical and Vocational Education and Training both in the formal and informal sectors of the Nigerian economy will facilitate the development of human capacity necessary to drive a production-oriented economy. The paper recommends that the Federal government should stop paying lip service to TVET, but invest copiously in it to decisively deal with the challenges militating against effective implementation of technical and vocational education in other to make productivity the centre of Nigeria economy.

KEYWORDS: Technical and Vocational Educational and Training, Production–oriented Economy, Skill acquisition.

1. INTRODUCTION

In the recent past, Nigeria economy suffered series of problems ranging from excessive dependence on imports both for consumption and capital goods to consistent fall in capacity utilization rate. Oil and gas sector, being the major driver of Nigeria economy, accounted for about 95% of the export earnings of the economy and 85% of government revenue (Nude chinyere, Eze & Nweke, 2018) and oil prices continue to dominate the country’s economic growth pattern. According to Focus Economics (2019), Gross Domestic Product (GDP) has consistently fallen since 2015 as a result of consistent fall in manufacturing productivity. Non-oil and non-agricultural growth which remained negative up to third quarter of 2017 strengthened through 2017 but still remain weak till date. Improving labour productivity, according to Uniprojects.net (2019) may be required for economic recovery and growth.

Labour productivity and modern economic growth that is production-oriented, according to Nude chinyere et al (2018), is extensively based on technical development of productive strategies which transforms economy into modern mass production system necessary for rapid economic development and growth. According to International Labour Organisation (2011), good quality primary and secondary education complemented by relevant vocational training and skill development only guarantees productivity in future generation. TVET has therefore been recognized by many countries globally for helping to develop professionally skilled workforce vital to economic and technical development (Oviawe, 2018).

The current economic challenge facing the country, no doubt, is rooted in the state of educational system and 1st National Conference of WITED, Ilaro Chapter
policies. This state of education is inundating the society with graduates that are not well trained with mind of contributing to economic growth of the country in terms of relevant manpower in the mainstream sectors such as science and technology, engineering, mining, construction, agriculture and so on.

The accumulation of human capital through formal education has two possible routes. One route is a more general education that aims to provide general knowledge in a variety of subjects, typically allowing for more flexibility in choosing a profession later in life. The other route is technical-vocational education and training (TVET), which aims to prepare students/trainees for specific occupations in the labour market. TVET provides young individuals with more opportunities for insertion into the labour market in the short run but can generate more difficulties in finding employment at advanced ages due to the more specific skills acquired from this education (Hanushek, Woessmann, & Zhang, 2011). Oyenuga, Odunaike and Wahab (2015) identified areas of specialization in technical and vocational education to include animal production, ceramics and textile design, metal work and fabrications, tie and dye, batik production, among others. Youths, through TVET can assume entrepreneurial position as, according to Alhasan and Abdullahi (2013), there is nothing that can surpass the effectiveness of hands on training which has been referred to as hand dexterity.

Nwosu and Micah (2017) opined that this type of education leading to acquisition of vocational and technical skill has been the ideal if not the only tool for national economic development and self-reliance. According to Sekenu (2004), many countries of the world have considered TVET as relevant in equipping young people with technical skills that would enable them engage in productive livelihoods. Hence, in creating a production-oriented and dynamic economy, Nigeria needs to recognize, among other things, the place of Technical Vocational Education and Training (TVET) as a necessary tool.

Okoye and Okwelle (2013) defined TVET as the form of education that advocates development of the head (knowledge), training of the hand (dexterity) and enriching the heart. It is a result-oriented form of education. It is not education for the dullards or educationally disadvantaged people. Nwosu and Micah (2017) posit that the term Technical and Vocational Education is a conjoined term made up of Technical Education (TE) and Vocational Education (VE). It is an aspect of educational system that provides room for vocational training, skill acquisition and adequate scientific competence. It is an aspect of education tailored towards enhanced productivity of the labour force.

United Nations Educational Scientific and Cultural Organization (UNESCO) in Okwelle and Deebom (2017) defines TVET as all forms and levels of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupation in various sectors of economic life. According to Ansah and Kissi (2013), TVET is expected to equip learners with the technical skills needed for industrial and economic development. It is concerned with production of manpower who will apply scientific skills to environmental and economic problems. Hence, TVET can be regarded as a formal or non-formal programme meant to develop competent and demand-driven manpower for the industrial sector, leading to industrial and technological advancement.

The above definitions on TVET underscore the importance of the programme to creating a production-oriented economy. Okwelle and Deebom (2017) assert that technological advancement of any nation depends hugely on its ability to transform its resources into practical reality, which guarantees its self-sustenance and viability. It was further explained that most of the advanced or developed countries such as China, the USA, Japan, France, inter alia practiced a unique but home-tailored TVET capable of utilizing their resources to meet its socio-economic needs with a view to creating jobs. These countries made productivity the center point of their economy with emphasis on TVET. They attained tremendous heights in terms of industrialization as a result of consistent investment in technical and vocational education and training. This enhances the income/revenue disposition of the citizens by making them self-reliant and responsible, and invariably reduces poverty and boosts economic growth.

Although studies highlight numerous benefits of TVET, Okwelle and Deebom (2017) opine that inadequacy of training facilities poses a major challenge to TVET curriculum implementation. It was argued that many machines for training in technical skills may be out of use for long time pending order and delivery of damaged parts from country of manufacture. Masaruf (2015) also says TVET curriculum is based on foreign model. He identified non-uniformity as a curriculum defect. Also, he opines that TVET has always had to battle against suspicion that they provide second-class education. In Nigeria, TVET have a very low image to the extent that members of public, including TVET teachers do not encourage their wards and siblings to enlist for TVET certificates. This has always led to low students’ morale which consequently affects skill acquisition and productivity.
Other challenges of TVET in Nigeria, according to Okwelle and Deebom (2017) include gross neglect and acute shortage of qualified teachers. It appears that Nigeria government does not seem to give this type of training programme the attention it deserves. Poor funding and poor remuneration of teachers leading to brain drain grossly affect effective implementation of TVET negatively.

1.1 Objectives of The Study

The objectives of this paper are to highlight on:

10. The extent to which Technical and Vocational Education and Training contribute to development of skills acquisition necessary for production-oriented economy.

11. The extent to which the challenges militating against TVET affect its effectiveness as a tool for production-oriented economy.

1.2 Statement of The Problem

Nigeria has been confronted with many economic and social related challenges. Different measures have been adopted by government at various levels to allocate most economic problems. The education system is generally regarded as bedrock of development and productivity. Year in year out, Nigerian educational institutions produced graduates with varying levels and types of competencies and skills. However, Nigeria remains an import economy as fewer goods are produced locally that are not adequate to meet local demands not to talk of exportations. Many researchers attribute economic development to nations’ abilities to be production-oriented than consumption oriented. For any nation to be a production-oriented economy, a skilled workforce with varying technical competences and vocational skills is required which fall within the purview of TVET objectives. Hence this study looks into the extent to which TVET enhances creation of production-oriented economy in Nigeria.

1.3 Research Questions

The following research questions were raised to guide the study:

- To what extent is the contribution of TVET to skills acquisition necessary for production-oriented economy?
- To what extent do the challenges of TVET affect its effectiveness as a tool for creating production-oriented economy?

2. RESEARCH METHODOLOGY

This study is descriptive in design and employs survey method with the use of questionnaire to gather its data from the lecturers of vocational and technical courses in two polytechnics in Ogun State which are Federal Polytechnic Ilaro and Moshood Abiola Polytechnic, Abeokuta. A total of 100 lecturers were randomly selected to form the sample.

A structured questionnaire on a four-point Likert-type rating scale was used as instrument for data collection with the following response mode: Very High (VH) – 4, High (H) – 3, Low (L) – 2, and Very Low (VL) – 1. The questionnaire was validated by two experts in the field and its reliability was determined by test-retest method. Pearson Product Moment correlation test yielded 0.83 which was considered high enough for the study. Data collected were analyzed with frequency count and mean.
3. RESULTS

**Research Question 1:** To what extent is the contribution of TVET to skills acquisition necessary for production-oriented economy?

Table 1: Extent to which TVET contribute to acquisition of skills necessary for production-oriented economy

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statement</th>
<th>X</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TVET contribute to acquisition of productive technical skills like welding and fabrication, metal works, tie and dye making and art work among others</td>
<td>3.49</td>
<td>High Extent</td>
</tr>
<tr>
<td>2</td>
<td>TVET equips learners with skills or industrial development</td>
<td>3.52</td>
<td>Very High Extent</td>
</tr>
<tr>
<td>3</td>
<td>TVET equips learners with entrepreneurial skills, making them productive and employers of labour</td>
<td>3.58</td>
<td>Very High Extent</td>
</tr>
<tr>
<td>4</td>
<td>TVET contributes to production-oriented economy by equipping learners with practical skills and scientific competence to enhance labour productivity</td>
<td>3.52</td>
<td>Very High Extent</td>
</tr>
<tr>
<td>5</td>
<td>TVET equips learners with creativity and innovativeness necessary for productive contributions through practical industrial training.</td>
<td>3.44</td>
<td>High Extent</td>
</tr>
</tbody>
</table>

Grand Mean 3.51 Very High Extent

The result in Table 1, with the grand mean of 3.51, reveals that respondents rated contributions of TVET to acquisition of skills necessary for production-oriented economy to very high extent.

**Research Question 2:** To what extent do the challenges of TVET affect its effectiveness as a tool for creating production-oriented economy?

Table 2: Extent to which challenges of TVET affect its effectiveness as a tool for creating production-oriented economy

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statement</th>
<th>X</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Neglect and low government involvement</td>
<td>3.32</td>
<td>High Extent</td>
</tr>
<tr>
<td>2</td>
<td>Poor funding and inadequate training facilities</td>
<td>3.64</td>
<td>Very High Extent</td>
</tr>
<tr>
<td>3</td>
<td>Unfavourable policy (disparity and discrimination) and poor public perception</td>
<td>3.74</td>
<td>Very High Extent</td>
</tr>
<tr>
<td>4</td>
<td>Acute shortage of qualified teachers and poor training delivery</td>
<td>3.38</td>
<td>High Extent</td>
</tr>
<tr>
<td>5</td>
<td>Poor remuneration and condition of service for instructors leading to brain drain</td>
<td>3.32</td>
<td>High Extent</td>
</tr>
</tbody>
</table>

Grand Mean 3.48 High Extent
Analysis in Table 2 shows respondents’ rating on the extent to which challenges militating against TVET affect its effectiveness as a tool for creating production-oriented economy. The mean ratings of all the items range between 3.32 and 3.74 with the grand mean of 3.48 which falls with the high extent rating.

4. DISCUSSION

The findings from analysis on Research Question 1 revealed that TVET contributes very highly to acquisition of technical skills as well as entrepreneurial skills which enhance labour productivity and boost production-oriented economy. This finding agrees with Ansah and Kissi (2013) who opine that TVET is expected to equip learners with the technical skills needed for industrial and economic development. This also corroborate Oyenuga, Odunaike and Wahab (2015) who identified areas of specialization in technical and vocational education to include animal production, ceramics and textile design, metal work and fabrications, tie and dye and batik production, among others.

Analysis in Table 2 shows a high extent influence of challenges militating against TVET on its effectiveness as a tool for creating production-oriented economy. The findings reveal that neglect, low government involvement and poor funding would affect effectiveness of TVET to a high extent. It was also revealed that unfavourable policies, disparity and discrimination, and poor public perception influence effectiveness of TVET to a very high extent. These findings agree with Masaruf (2015) who was of the view that TVET has very low image and has always had to battle against suspicion that they provide second-class education. The findings are also in agreement with Okwelle and Deebom (2017) who opine that gross neglect and acute shortage of teachers, as well as inadequacy of training facilities militate against effective implementation of TVET curriculum. By implication, unless the challenges are decisively dealt with, students of TVET would not be able to acquired required skill to be self-reliant and productive for the much desired production-oriented economy.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Considering the contributions of Technical and Vocational Education and Training to development and acquisition of technical, vocational and entrepreneurial skills, it could be concluded that TVET is a major tool for creating production-oriented economy in Nigeria. It could also be concluded that TVET has not been effective for creating production-oriented economy in Nigeria because of the numerous challenges militating against the effective implementation of the curriculum.

5.2 Recommendations

On the basis of the findings and conclusion above, it is recommended that:

10. The Nigerian governments at all levels should stop paying lip-service to TVET but should invest copiously in it.
11. Government should review policies that are unfavourable to TVET and make this type of education more attractive to the public.
12. Government and training institutions should give priority to welfare of lecturers and instructors of technical and vocational courses to attract best brains, boost their moral and prevent brain drain.

REFERENCES


*1st National Conference of WITED, Ilaro Chapter*


ABSTRACT

This study was carried out to examine the relationship between students’ technological self-efficacy and their academic performance in the Federal Polytechnic, Ilaro. The study is descriptive in design and employs survey method with the use of questionnaire to gather data. Three research questions were raised from which the questionnaire was developed to gather data. The population consists of students from the five schools/faculties in the Federal Polytechnic, Ilaro, Ogun State. A total of 150 students were randomly selected from the five schools as the sample size. Data collected were analyzed using simple frequency and mean method. The result indicates that technological self-efficacy has a great influence on students’ academic performance and perseverance in higher education. New technologies provide public accessibility to a vast variety of educational resources and learning opportunities. It is therefore recommended that Policy Makers should see technology use in education as a cure-all for the decline in the current educational system. To this end, Information and Communication Technology (ICT) courses should be included into students’ curriculum at every level of education. This will help increase the technological self-efficacy of students.

Keywords: Self-Efficacy, Technological Self-Efficacy, Students, Academic Performance.

1.0 INTRODUCTION

Academic success has a great influence on a student’s self-esteem, motivation, and perseverance in higher education. Poor academic performance or high failure rates may result in unacceptable levels of attrition, reduced graduate throughput and increased cost of education. Technology is a recent marvel in our everyday life that has taken off. The introduction of Information and Communication Technology (ICT) is promoting efficiency in all areas of human activities. Technology allows the most difficult tasks to become seamlessly easy and more efficient. In education, technology has allowed the dissemination of knowledge to be dispersed instantly and it allows for quicker and more effective communication. Also, technology has allowed students to be engaged and learn in ways that they never have in a classroom setting before. (Harris et al., 2014).

When we look at the simple things we do today, they are based on technology. Technology simply refers to use of science-based knowledge to get a solution to something or for practical applications and purposes. It may be the everyday activity or something in the industry. Whenever we use scientific knowledge to achieve something we want, then it means we are using technology (https://www.rappev.com, 2018). In recent time one of the major tools instrumental to student’s success is Technology. However, it may sometimes increase failure rate if not well managed. Students’ ability and assurance to understand and utilize technology may go a long way to increase their success rate. Technology thus is largely identified with the hardware of production or technical artifacts. Stewart provided probably the broadest definition of technology by including all skills, knowledge and procedures required for making, using and doing useful things. Technology in her definition therefore includes the software of production – managerial and marketing skills, and extended to services – administration, health, education and finance. Smillie describes this broader definition of technology as the science and art of getting things done through the application of skills and knowledge.

Technological self-efficacy has a great influence on students’ academic performance and perseverance in higher education. (Valli et al., 2014). New technologies provide public accessibility to a vast variety of educational resources and learning opportunities. Technology integration in education can enhance learning and teaching. The term “self-efficacy” refers to your beliefs about your ability to effectively perform the tasks needed to attain a valued goal. Self-efficacy does not refer to your abilities but to how strongly you believe you can use your
abilities to work toward goals. Self-efficacy is not a unitary construct or trait; rather, people have self-efficacy beliefs in different domains, such as academic self-efficacy, problem-solving self-efficacy, and self-regulatory self-efficacy. Stronger self-efficacy beliefs are associated with positive outcomes, such as better grades, greater athletic performance, happier romantic relationships, and a healthier lifestyle (Maddux and Kleiman 2019).

Self-efficacy is certainly worth having because as Henry Ford famously put it, whether you believe you can or you cannot, you are right. Self-efficacy plays a major part in determining our chances for success; in fact some psychologists rate self-efficacy above talent in the recipe for success. We need to pay special attention to self-efficacy when setting goals to make sure that our efficacy beliefs are in line with our aims and not working against them (Schunk 2001). Self-efficacy refers to perceived capabilities for learning or performing behaviors at designated levels. Self-efficacy can influence choice of activities, effort, persistence, and achievement. People acquire information about their self-efficacy for a given activity from their actual performances, vicarious experiences, forms of persuasion, and physiological symptoms. In educational settings, students have goals and varying levels of self-efficacy for learning. As they engage in a task they acquire skills and evaluate their learning progress. Perceptions of progress sustain self-efficacy and motivation and promote learning. Students’ self-efficacy is influenced by such contextual variables as goals, social models, rewards, social comparisons, and forms of feedback. Self-efficacy has been shown to predict student motivation and achievement across a variety of content areas (Schunk 2001).

Technological self-efficacy (TSE) is the belief in one’s ability to successfully perform a technologically sophisticated new task. This is a specific application of the broader and more general construct of self-efficacy, which is defined as the belief in one’s ability to engage in specific actions that result in desired outcomes. Self-efficacy does not focus on the skills one has, but rather the judgments of what one can do with his or her skills. Traditionally, a distinguishing feature of self-efficacy is its domain-specificity. In other words, judgments are limited to certain types of performances as compared to an overall evaluation of his or her potential (Wikipedia, 2018). Internet self-efficacy refers to the confidence in one’s capacity to sort out and execute Web activities required to deliver given accomplishments. Past Web experience is absolutely identified with Internet self-efficacy (Eastin & LaRose, 2000). People with high attitudes toward PCs have higher Internet self-efficacy, contrasted with those with low attitudes toward PCs. Preparing is accommodating in the change of learners’ Internet self-efficacy, particularly for those with higher dispositions toward PCs, and those with low PC tension (Torkzadeh & Dyke, 2002). Students with high Internet self-efficacy have better information searching skills and learn superior to those with low Internet self-efficacy (Tsai & Tsai, 2003).

In the light of the above, the study was carried out to examine technological self-efficacy as a correlate to students’ academic performance in the Federal Polytechnic, Ilaro.

1.1 Statement of The Problem

Students use personal computers, hand-held electronic tablets, the Internet, and other technologies to research, create, collaborate, communicate, and acquire critical thinking skills. These 21st century competences are all necessary for entry into the workforce. To harness the power of information technology to enhance classroom instruction and ultimately increase student learning outcomes, it will be necessary to examine the role technology self-efficacy and attitude toward technology use play in driving students’ personal use of technology to cross over into the educational setting. This study therefore investigates the relationship between students’ technological self-efficacy and their academic performance.

1.2 Objectives of The Study

The objectives of this study is to:

1. Identify the technological tools (both hardware and software) that students use for learning and how frequently they use them.

2. Determine the level of students’ technological self-efficacy in Federal Polytechnic, Ilaro.

3. Determine the extent to which students’ technological self-efficacy impact on their academic performance.
1.3 Research Questions

The following research questions guided this study.

1. What are the technological tools (both hardware and software) that students use for academic purpose and how frequently do they use them?
2. What is the level of students’ technological self-efficacy in the Federal Polytechnic, Ilaro.
3. To what extent do students’ technological self-efficacy impact on their academic performance?

2.0 METHODOLOGY

A descriptive survey research design was adopted for this study. The population used comprised of students in all the five Schools/Faculties in the Federal Polytechnic, Ilaro, Ogun State. 30 students were randomly selected from each School, giving a total sample size of 150 students from all the five Schools. Questionnaire was the main instrument used to gather data for the study. The questionnaire was design on a 4-point Likert scale with – Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) as the options from which respondents were asked to choose.

For the purpose of analysis, values were assigned to the four options provided in the instrument as follows: Strongly Disagree = 4 marks, Agree = 3 marks, Disagree = 2 marks and Strongly Disagree = 1 mark. Mean method of analysis was used to analyze the data collected. A total of 144 copies of questionnaire administered were retrieved by the researchers. The data collected were analyzed using Percentage and Mean methods. In making decision about the mean value, the score of the options on the questionnaire were added as SA + A + D + SD (4 + 3 + 2 + 1) = 10. This is then divided by 4 which gave 2.5. A minimum of 2.5 score was set as standard for acceptability. Hence any research question with score below the set standard (2.5) was rejected.

3.0 RESULTS

Research Questions 1: What are the technological tools (both hardware and software) that students use for academic purpose and how frequently do they use them?

Table 1.1: Technological tools (both hardware and software) that students use for academic purpose.

<table>
<thead>
<tr>
<th>S/N</th>
<th>QUESTIONNAIRE ITEM</th>
<th>Smart phone</th>
<th>Laptop/PC</th>
<th>Tablet/iPad</th>
<th>All</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Which of the following technological tools (hardware) do you use for academic purpose?</td>
<td>81</td>
<td>36</td>
<td>23</td>
<td>-</td>
<td>4</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>Figure</td>
<td>56</td>
<td>25</td>
<td>16</td>
<td>-</td>
<td>3</td>
<td>100</td>
</tr>
</tbody>
</table>
Source: Field Survey, 2019

Table 1.1 which sought to know the technological tool (hardware) that students use for academic purpose, shows that 56% of the respondents use smart phones for academic purpose, 25% use Laptop, 16% use Tablet/iPad while 3% use none. This signifies that 97% of the sample size use technological tools for academic purpose.

Table 1.2: Technological tools (both hardware and software) that students use for academic purpose.

<table>
<thead>
<tr>
<th>S/N</th>
<th>QUESTIONNAIRE ITEM</th>
<th>Pre-paid Data</th>
<th>School Wi-Fi</th>
<th>Cyber cafe</th>
<th>Others (specify)</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Which of these internet facilities do you have access to?</td>
<td>99</td>
<td>29</td>
<td>12</td>
<td>-</td>
<td>4</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>Figure</td>
<td>69</td>
<td>20</td>
<td>8</td>
<td>-</td>
<td>3</td>
<td>100</td>
</tr>
</tbody>
</table>
Source: Field Survey, 2019

1st National Conference of WITED, Ilaro Chapter
From Table 1.2, it shows that 69% of the respondents use their personal paid internet facility for academic purpose, 20% use the Polytechnic Wi-Fi facility, and 8% make use of internet facility at the commercial cyber café while 3% had no access to any internet facility. This indicates that 97% of the respondents make use of the internet for academic purpose.

**Table 1.3:** Technological tools (both hardware and software) that students use for academic purpose.

<table>
<thead>
<tr>
<th>S/N</th>
<th>QUESTIONNAIRE ITEM</th>
<th>Google</th>
<th>Research gate</th>
<th>Wikipedia</th>
<th>All</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Which of the following search engines do you use for academic purpose?</td>
<td>36</td>
<td>11</td>
<td>14</td>
<td>78</td>
<td>5</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>Figure</td>
<td>25</td>
<td>8</td>
<td>10</td>
<td>54</td>
<td>3</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2019

Table 1.3 shows that 97% of the respondents make use of the search engines like Google, Research gate, Wikipedia, etc. for academic purpose.

**Table 1.4:** Frequency of students’ technology usage

<table>
<thead>
<tr>
<th>S/N</th>
<th>QUESTIONNAIRE ITEM</th>
<th>Daily</th>
<th>Weekly</th>
<th>Monthly</th>
<th>Others (specify)</th>
<th>Not at all</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>How often do you use these technological tools for academic purpose?</td>
<td>96</td>
<td>28</td>
<td>16</td>
<td>-</td>
<td>4</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>Figure</td>
<td>66</td>
<td>19</td>
<td>12</td>
<td>-</td>
<td>3</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2019

Table 1.4 was used to show how frequent the respondents make use of these technological tools. 66% of the respondents make use of them daily, 19% make use of them on weekly basis, 12% on monthly basis while 3% of the respondents do not use these technological tools at any time.

Research Question 2: What is the level of students’ technological self-efficacy in the Federal Polytechnic, Ilaro.

**Table 2: Research Question 2 – Level of students’ technological self-efficacy.**

<table>
<thead>
<tr>
<th>S/N</th>
<th>QUESTIONNAIRE ITEM</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>Total</th>
<th>Mean</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>I operate computer very well and effectively for learning and research purpose.</td>
<td>26</td>
<td>91</td>
<td>17</td>
<td>10</td>
<td>144</td>
<td>3.0</td>
<td>Accepted</td>
</tr>
<tr>
<td>6</td>
<td>I use smart phone efficiently for learning and research purpose.</td>
<td>114</td>
<td>17</td>
<td>9</td>
<td>4</td>
<td>144</td>
<td>4.5</td>
<td>Accepted</td>
</tr>
<tr>
<td>7</td>
<td>I use Tablet/ipad phone efficiently for learning and research purpose.</td>
<td>-</td>
<td>55</td>
<td>76</td>
<td>13</td>
<td>144</td>
<td>2.3</td>
<td>Accepted</td>
</tr>
<tr>
<td>8</td>
<td>I have the necessary ICT skills to use technological tools for academic purpose.</td>
<td>47</td>
<td>76</td>
<td>21</td>
<td>-</td>
<td>144</td>
<td>3.1</td>
<td>Accepted</td>
</tr>
<tr>
<td>9</td>
<td>I can use any of these tools for browsing and downloading educational materials</td>
<td>40</td>
<td>82</td>
<td>12</td>
<td>10</td>
<td>144</td>
<td>3.1</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2019
Table 2 was used to seek information on the level of students’ technological self-efficacy. An average mean of 3.2 was recorded which shows that majority of the respondents had a high level of technological self-efficacy, which means they were competent in using technology for academic purpose.

Research Question 3: To what extent do students’ technological self-efficacy impact on their academic performance?

Table 3: Research Question 3 – Impact of technological self-efficacy on students’ academic performance.

<table>
<thead>
<tr>
<th>S/N</th>
<th>QUESTIONNAIRE ITEM</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>Total</th>
<th>Mean</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Technological self-efficacy allows me to study independently.</td>
<td>87</td>
<td>36</td>
<td>12</td>
<td>9</td>
<td>144</td>
<td>3.4</td>
<td>Accepted</td>
</tr>
<tr>
<td>11</td>
<td>Technological self-efficacy helps me to give and receive learning materials with class group.</td>
<td>101</td>
<td>39</td>
<td>4</td>
<td>-</td>
<td>144</td>
<td>3.7</td>
<td>Accepted</td>
</tr>
<tr>
<td>12</td>
<td>As a student, technological self-efficacy helps me a lot for my research work.</td>
<td>101</td>
<td>39</td>
<td>4</td>
<td>-</td>
<td>144</td>
<td>3.7</td>
<td>Accepted</td>
</tr>
<tr>
<td>13</td>
<td>Using instructional technology in the classroom makes it easier for me to learn and understand.</td>
<td>121</td>
<td>15</td>
<td>8</td>
<td>-</td>
<td>144</td>
<td>3.8</td>
<td>Accepted</td>
</tr>
<tr>
<td>14</td>
<td>Technological self-efficacy makes learning more interesting and exciting for me.</td>
<td>125</td>
<td>13</td>
<td>3</td>
<td>3</td>
<td>144</td>
<td>3.8</td>
<td>Accepted</td>
</tr>
<tr>
<td>15</td>
<td>I usually do well in technology-based courses and Computer Based Test and Examinations (CBTE) because of my technology self-efficacy.</td>
<td>131</td>
<td>8</td>
<td>5</td>
<td>-</td>
<td>144</td>
<td>3.9</td>
<td>Accepted</td>
</tr>
<tr>
<td>16</td>
<td>I get more tasks accomplished quickly because of my technological self-efficacy.</td>
<td>131</td>
<td>9</td>
<td>4</td>
<td>-</td>
<td>144</td>
<td>3.9</td>
<td>Accepted</td>
</tr>
<tr>
<td>17</td>
<td>My technological self-efficacy improves my academic performance generally.</td>
<td>132</td>
<td>8</td>
<td>4</td>
<td>-</td>
<td>144</td>
<td>3.9</td>
<td>Accepted</td>
</tr>
<tr>
<td>18</td>
<td>My technological self-efficacy has positive impact on my academic performance.</td>
<td>132</td>
<td>8</td>
<td>4</td>
<td>-</td>
<td>144</td>
<td>3.9</td>
<td>Accepted</td>
</tr>
<tr>
<td></td>
<td><strong>Average Mean</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>3.8</strong></td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2019

Table 3 was used to seek information on the extent at which student’s technological self-efficacy impact positively on their academic performance. An average mean of 3.8 was recorded which shows that students’ technological self-efficacy has a positive impact on their academic performance.

4.0 DISCUSSION OF RESULTS

Research Question one was used to gather information on which technological tools (both hardware and software) were available to students for academic purpose and how frequent they make use of them. It was discovered that 97% of the students make use Smartphones, laptops and iPads for learning and research purposes. 97% of the students also make use of internet facilities for academic purpose. They make use of these technological tools very often as it was gathered that 85% of the students make use of technological tools (hardware and software) daily and weekly. This affirms the opinion of Fletcher (2006) that students of all ages interact with instructional technology daily within the classroom. Students use personal computers, hand-held electronic tablets, the Internet, and other technologies to research, create, collaborate, communicate, and acquire critical thinking skills. Technology usage is increasing in other demographics as well. In less than one year, smartphone ownership and use has increased 6% among Americans over age 18 (Smith, 2015).

The data collected from research question two which sought to know the level or extent of students’ technological self-efficacy shows the average mean of 3.2. This denotes that students have a high level of self-efficacy in using technology especially for academic purpose. Prensky (2001) suggests 21st century students are different from previous generations of students due to their total immersion in a digital culture. Surrounded by video games, cell phones, computers, the Internet, and other technologies, these students “think and process information fundamentally differently from their predecessors” and are “native speakers” of the digital language (Prensky, 2001). These 21st century competences are all necessary for entry into the workforce (Spires, Lee, & Turner, 2008).
Research question three was used to seek information on the extent at which student’s technological self-efficacy impact positively on their academic performance. An average mean of 3.8 was recorded which shows that students’ technological self-efficacy has a positive impact on their academic performance. In assertion to this, the U.S. Department of Education’s 2010 National Education Technology Plan (NETP) outlines bringing “state-of-the art technology into learning to enable, motivate, and inspire all students, regardless of background, languages, or disabilities, to achieve. It influences the power of technology to provide personalized learning and to enable continuous and lifelong learning. Also, Students with high Internet self-efficacy have better information searching skills and learn superior to those with low Internet self-efficacy (Tsai & Tsai, 2003).

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion
Technology has permeated all aspects of life, education being no exception. Technology use is no longer limited to home, school, or work. Technology is a powerful tool with the ability to change the educational landscape. The arrival of mobile devices has created omnipresent computing, facilitating an increase in the time students and adults spend working with technology. Taking multitasking into consideration, students’ daily interaction with some form of technology increased to over 10 hours and 45 minutes. Technology usage is increasing in other demographics as well. In less than one year, smartphone ownership and use has increased 6% among Americans over age 18. Technology has therefore become an integral part of current national and local educational goals.

5.2 Recommendations
Based on the findings, the following recommendations were made:

- Policy Makers should see technology use in education as a cure-all for the decline in the current educational system. To this end, Information and Communication Technology (ICT) courses should be included into students’ curriculum at every level of education. This will help increase the technological self-efficacy of students.
- Institutions of higher learning should provide viable ICT Centers and internet facilities for students within the campus to facilitate e-learning among students.
- Parents should help their wards in higher institutions to get an affordable technological tools which will go a long way to improve their learning attitudes.
- Students at all level should embrace technology; knowing fully well that technology has become an integral part of current national and local educational goals.

REFERENCES

Journals


1st National Conference of WITED, Ilaro Chapter


**Books**


**Web Reference**


ABSTRACT
This paper investigated the implications of women in Science, Technology, Engineering and Mathematics (STEM) on growth in Nigeria. Annual data from 1980-2017 on female labour force participation rate, male labour force participation rate and total labour force participation rate in the country were collated. Real gross domestic product was employed as a proxy for growth. The main objective of this study was to examine the impact of women in STEM on growth in Nigeria considering the proportion of female employed in the labour force relative to male. The existence of cointegration was established between RGDP and the control variables and on this basis, the long and short-term autoregressive distributed lag (ARDL) model was employed to account for any potential non-stationarity in the model. The results reveal that in both the short-term and the long-term, there exist a positive relationship between female labour force participation rate and real gross domestic product, male labour force participation rates and real gross domestic product and a negative relationship between total labour force participation and real gross domestic product. The findings led to the conclusion that economic growth can be stimulated through the adoption of both short-term and long-term policies to ensure that women in STEM contribute immensely to real gross domestic product in the economy.

Keywords: STEM, ARDL, Female labour force participation rate, Male labour force participation rate, Total labour force participation rate.

1.0 INTRODUCTION
1.1 Women in science, technology, engineering and mathematics (STEM) fields typically construed as well-compensated, high-status professions with universal career appeal (Ceci et al 2009, Griffith 2010) is thought of having significant impact on a number of policies targeted at accelerating the pace of productivity, inclusive growth and sustainable development.

Nonetheless, stereotypes and educational differences can lead to the decline of women in STEM fields. These differences start as early as the third grade according to Dee (2007), with boys advancing in math and science and girls advancing in reading.

This paper seeks to consider the vast opportunities that abound to any economy in terms of increase in output as a result of having more women in STEM relative to men translating into increase in female labour force participation relative to male by adopting a pragmatic approach.

It was asserted that the rising female employment captured by the rising female labor force participation rates in the rich countries has been a major driving force behind global gross domestic product in the last two decades at the world economy level. The stimulating impact of rising female labor force participation has been found widely in India and China; the states growing the fastest, reducing poverty and child mortality the most are those with the highest percentage of women in the labor force (Blumberg, 2006).
1.2 Objectives of The Study

The aim of this paper is to examine the impact of women in STEM on growth, considering the proportion of women involved in the labour force relative to men in the economy.

The specific objectives include to:

(i) examine the contribution of the labour force to productivity (output) in the economy,

(ii) compare the contributions of female labour force participation rates and male labour force participation rates toward growth in the economy.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework

According to modernization theorists, changes in the professional or occupational structure (meant to be the increasing availability of service and white-collar jobs) and increases in educational opportunities as well as reduction in fertility rates and ultimately household responsibilities are the conduit through which economic growth is related to women’s participation in the labour force. Modernization process is associated with increased labour demand, socially accepted education and employment of women and lower fertility rates Heckman (1978); Standing (1981); Bauer and Shin (1987). Some theoretical and empirical studies in the literature have found that female labor force participation has positive and strong links with economic growth (Tansel (2002); Fatima and Sultana (2009)). Worldwide trends indicate that women have a relatively more stable relationship between labor market participation and economic growth.

2.2 An Overview of Participation of Women in STEM

Women in STEM engaged in the labour force has significant impact on the pace and distribution of economic growth, sustainable development and improvement in the overall welfare of states and nations. However, a number of indices including stereotypes and differences in education can result into a fall in the proportion of women engaged in STEM field and invariably, the proportion of women engaged in the labour force.

In comparison with men in STEM, women’s representation is relatively low as adduced by a number of societal, psychological as well as innate factors.

On the societal perspective for the low representation of women in STEM in comparison with their male counterparts, Schiebinger (1999) opines that women are twice as likely to leave jobs in science and engineering than men are as a result of discrimination. Miyake et al (2010) posits that negative stereotypes about women's quantitative abilities may lead people to devalue their work or discourage these women from continuing in STEM fields. While Taylor and Hosch, (2004) in ‘The black sheep effects’ opine that women who are established in STEM fields will be more likely than established men to assist early career women with sufficient qualification and will be less likely than men to assist early career women with insufficient qualifications, Cooper (1997) and Ellemers et al (2004) in ‘The Queen Bee effect’ provides explanations as to the reasons higher-status women, particularly in male-dominated professions, could actually be far less likely to help other women than their male counterparts could. The effect being identical to the Black Sheep effect but relates majorly to women.


The psychological factors for women’s low representation in STEM relative to their male counterparts as stated by Su et al (2009) include lack of interest, lack of confidence and in a meta-analysis, opined that while men prefer working with things, women prefer working with people and classifying interest by RAISEC method; Realistic, Investigative, Artistic, Social, Enterprising, Conventional, discovered that men indicate stronger Realistic and Investigative interests and women on the other hand, display stronger Artistic, Social, Enterprising and Conventional interests
Also relating to the psychological perspective is the lack of confidence which according to Pell (1996) erupts from adolescence which can be attributed to unqualified or effective teachers. Teachers’ gendered perceptions on their students’ capabilities can create an unbalanced learning environment and deter girls from pursuing further STEM education (Barbara et al 2017). Keller et al (2001) noted that teachers can further transfer the stereotyped beliefs unto their students. Johnson (2007) shows that student-teacher interactions affect girls’ engagement with STEM as teachers often give boys more opportunity to figure out the solution to a problem by themselves while telling the girls to follow the rule (Schiebinger, 1999). Teachers are also more likely to accept questions from boys while telling girls to wait for their turns (Pell, 1996) which is partly attributed to gender expectations that boys will be active but that girls will be quiet and obedient (Lips, 2008).

Page (2015) discovered that women steer away from STEM fields because they believe they are not qualified for them and suggested the encouragement of girls to participate in more mathematics classes to increase their interests. Ellis et al (2016) observed that of STEM-intending students, while 35% of women stated that their reason for leaving calculus was as a result of their inability to comprehend the material, only 14% of men gave the same reason. The difference in reason for leaving calculus is thought to develop from women's low level of confidence in their ability, and not actual skill and thus, continue to establish that women and men have different levels of confidence in their ability and that confidence is related to how individual's perform in STEM fields (Ellis et al 2016). Kelly (2013) opined that programs designed to diminish anxiety in math or improve confidence have a positive impact on women continuing their pursuit of a career in the STEM field.

Steinberg (2012) purports that besides lack of confidence barring women from entering STEM fields, women in upper-level courses with higher skill are more strongly affected by the stereotype that they do not possess innate ability to succeed as constrained upon them by nature, which impact a negative effect on women’s confidence despite making it through courses designed to filter students out of the field.

Another psychological reason adduced for low representation of women in STEM is stereotype threat arising from the fear that an individual's actions will confirm a negative stereotype about the individual's in-group which creates additional stress, consuming valuable cognitive resources and lowering task performance in the threatened domain (Schmader & Johns 2003, 2002, Spencer et al 1999 and Steele et al 1995). Individuals are susceptible to stereotype threat whenever they are assessed in a domain for which there is a perceived negative stereotype about a group to which they belong. Steele et al (2002) opine that individuals who identify strongly with a certain area are more likely to have their performance in that area hindered by stereotype threat than those who identify less strongly with the area implying that even highly motivated students from negatively stereotyped groups are likely to be adversely affected by stereotype threat and may have to disengage from the stereotyped domain. Bork (2012) also observed that negative stereotypes about girls’ capabilities in mathematics and science drastically lower their performance in mathematics and science courses as well as their interest in pursuing a career in STEM.

The innate explanation bothers on the proposition that STEM fields are largely considered by both teachers and students to require more innate talent than skills that can be learned (Miller, 2015). It was further proposed that the tendency to view women as having less of the required innate abilities could result in assessing women as less qualified for STEM positions. Ellis et al (2016) concluded that without strong skills in calculus, women cannot perform as well as their male counterparts in any field of STEM, which leads to the fewer women pursuing a career in these fields and that a high percentage of women that do pursue a career in STEM discontinue on this pathway after taking calculus as it was discovered to be a class that weeds out students from the STEM pathway.

Williams (1992) in his paper; “The Glass Escalator: Hidden Advantages for Men in the 'Female' Professions” concludes that while men in female-dominated occupations may contend with negative stereotypes about their masculinity, the men may also enjoy some benefits and suggests that women in male-dominated occupations tend to hit a glass ceiling which can impede them to aspire to the top of their profession while men in female-dominated occupations may hit a glass escalator which confers on the men the opportunity to excel in female-dominated profession.
However, there is a unanimous conclusion in the literature on increasing the number of women in STEM that girls must be given access to technology and opportunities to learn digital skills from a young age.

2.3 Increasing Women’s Participation In STEM

Sonneret et al (2007) and Stout et al (2011) proposed the need for mentorship and opined that the support and encouragement of a mentor can make a lot of difference in women's decisions of whether or not to continue pursuing a career in their discipline in STEM fields. Griffith (2010) asserts that this may be particularly true for younger individuals who may face many obstacles early on in their careers since these younger individuals often look to those who are more established in their discipline for help and guidance, making the responsiveness and helpfulness of potential mentors incredibly important.

Johns et al (2005) proposed educating individuals about the existence of stereotype threat while Marx and Roman (2002) proposed the use of role models as a technique for alleviating stereotype threat.

On the issue of addressing the digital gender gap in the country, Ogundipe suggests that digital skills should be part of the school curriculum to encourage budding ICT talents and according to Okello, the implication of including digital skills as part of school curriculum implies that governments must invest in appropriate STEM education for young girls and boys in ways that allow them to be creative, to explore and to innovate.

A number of programmes targeted at encouraging women and girls to venture into male-dominated professions in STEM should be embarked upon while being aggressively supported by the government, society, parents, teachers and care-givers. A number of organizations include; The United State government’s Department of State’s Bureau of Educational and Cultural Affairs TechGirls and TechWomen, exchange programs which teach Middle Eastern and North African girls and women skills valuable in STEM fields and encourage them to pursue STEM careers, UNESCO Teach-Her-Initiative, United Kingdom’s Wise program, The Educate-to-Innovate campaign of the Obama administration in cooperation with the White House Council on women and girls targeted at increasing the participation of women and girls in STEM fields.

At the national level, programmes targeted towards increasing the number of women and girls in STEM include; Girls Coding of Pearl Africa Foundation, InspireIT, Women’s Technology Empowerment Centre (W.TECH.) Paradigm Initiative Nigeria and The Visiola Foundation.

2.4 Empirical / Stylized Facts

Gresky et al (2005) found that women who were encouraged to draw self-concept maps with many nodes did not experience a performance decrease on a math test while women who did not draw self-concept maps or only drew maps with a few nodes did perform significantly worse than men on the math test and concluded that the effect of these maps with many nodes was to remind women of their “multiple roles and identities,” that were unrelated to, and would thus not be harmed by, their performance on the math test.

Johns et al (2005) found that women who were taught about stereotype threat and how it could negatively impact on their performance in math performed as well as men on a math test, even when stereotype threat was induced and also performed better than women who were not taught about stereotype threat before they took the math tests. This results into an increase in the number of women in STEM as well as the labour force with the accompanying improvement in the pace and distribution of output, improvement in maternal health, reduction in infant / child mortality and increase in the wealth of nations.

Marx and Roman (2002) discovered that women who took a math test that was administered by a female experimenter did not suffer a fall in their performance when compared to women whose test was administered by a male experimenter. Additionally, these researchers found that it was not the physical presence of the female experimenter but rather learning about her apparent competence in math that buffered participants against stereotype threat.
McIntyre et al (2003) observed that female participants who read about successful women, even though these successes were not directly related to performance in math, performed better on a subsequent math test than participants who read about successful corporations rather than successful women.

Stearns (2016) showed that female teachers can also act as role models for young girls as the presence of female teachers positively influences girls’ perceptions of STEM and increases their interest in STEM careers.

Martens et al (2006) investigating self-affirmation to aid in alleviating stereotype threat discovered that women who affirmed a personal value prior to experiencing stereotype threat performed as well on a math test as men and as women who did not experience stereotype threat.

Women’s Right Online research discovered that women in urban poor areas across the Global South are up to 50% less likely to have internet access and The United Nation’s International Day for Women and Girls in Science (2017), geared at celebrating the critical contribution of women in science and technology emphasized the existence of digital gender gap that millions of women are either offline, silenced by hostile online spaces, or falling behind in acquiring critical skills needed for STEM careers.

3.0 METHODOLOGY AND DATA ISSUES

To investigate the relationship between economic growth and women in STEM, annual data on female labour force participation rate and Real Gross Domestic Product; RGDP were employed. Data on male labour force participation rate as well as total labour force participation rate were also included in the analysis. The labour force is defined as the number of individuals who are employed and those that are unemployed but available, willing to work and have scouted for a job recently but could not get employed.

This study adopted the seminal contribution of Dogan and Akyuz (2017) and data was sourced from the World Development Indicators; WDI and International Labour Organisation (ILO) statistics. Female labour force participation rate is given as percentage of female labour force participation as a ratio of the percentage of the total labour force. The series were examined to determine whether their mean and variance are constant and confirm that the covariance of the series depends on the lead or lag series and not on time. Real gross domestic product (RGDP) was employed as a proxy for economic growth as it allows for the distortion of fluctuating prices on intertemporal total output.

The ARDL bound test was employed as it allows for estimation of series of I(0) and I(1) series. The base-line model employed for this paper is given as:

\[ RGDP_t = \delta_0 + \delta_1 FLFP + \delta_2 MLFP + \delta_3 TLFP + \epsilon_t \] .........................................................(1)

Following the work of Pesaran et al (2001), the long run equation is given as:

\[
\Delta RGDP_t = \gamma_0 + \sum_{i=1}^{q} \gamma_i \Delta RGDP_{t-i} + \sum_{j=0}^{m} \gamma_j \Delta FLFP_{t-j} + \sum_{k=0}^{n} \gamma_k \Delta MLFP_{t-k} + \sum_{l=0}^{\epsilon} \gamma_l \Delta TLFP_{t-l} \\
+ \mu_1 RGDP_{t-i} + \mu_2 FLFP_{t-j} + \mu_3 MLFP_{t-k} + \mu_4 TLFP_{t-l} + \epsilon_t \] .........................................................(2)

Further, the Error correction model adapted for this study is given below;

\[
\Delta RGDP_t = \phi_0 + \sum_{i=0}^{V_1} \phi_i \Delta RGDP_{t-i} + \sum_{j=0}^{V_2} \phi_j \Delta FLFP_{t-j} + \sum_{k=0}^{V_3} \phi_k \Delta MLFP_{t-k} + \sum_{l=0}^{V_4} \phi_l \Delta TLFP_{t-l} + ECT_{t-1} \] .........................................................(3)

4.0 EMPIRICAL ANALYSIS AND DISCUSSION OF RESULTS

4.1 Data Issues and Preliminary Analysis
The study employed data from the World Bank’s World Development Indicators for the period 1980 to 2017. The group statistical features of the series adopting the standard procedures for variables with time series properties was embarked upon from conducting the descriptive statistics presented below:

Table 1: Descriptive Statistics of Variables

<table>
<thead>
<tr>
<th></th>
<th>FLFPR</th>
<th>MLFPR</th>
<th>TLFPR</th>
<th>RGDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>43.0455</td>
<td>68.3826</td>
<td>56.2350</td>
<td>3.32E+13</td>
</tr>
<tr>
<td>Maximum</td>
<td>48.3000</td>
<td>74.8000</td>
<td>57.0000</td>
<td>6.98E+13</td>
</tr>
<tr>
<td>Minimum</td>
<td>34.4545</td>
<td>61.9000</td>
<td>54.8000</td>
<td>1.52E+13</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>4.8048</td>
<td>4.9433</td>
<td>0.6944</td>
<td>1.84E+13</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.3534</td>
<td>0.0138</td>
<td>-0.5162</td>
<td>0.8447</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.6211</td>
<td>1.2468</td>
<td>1.9939</td>
<td>2.1123</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>3.8014</td>
<td>4.8682</td>
<td>3.2897</td>
<td>5.7675</td>
</tr>
<tr>
<td>Probability</td>
<td>0.1494</td>
<td>0.0877</td>
<td>0.1930</td>
<td>0.0559</td>
</tr>
<tr>
<td>Sum</td>
<td>1635.73</td>
<td>2598.54</td>
<td>2136.93</td>
<td>1.26E+15</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>854.18</td>
<td>904.15</td>
<td>17.843</td>
<td>1.26E+28</td>
</tr>
</tbody>
</table>

Source: Researchers’ compilation using E-views 10.

Note: FLFPR, MLFPR, TLFPR, RGDP represent female labour force participation rate, male labour force participation rate, total labour force participation rate, real gross domestic product.

Real gross domestic product was employed instead of nominal gross domestic product to allow for the impact of inflation on intertemporal output. The female labour force participation rate is given as the percentage of female labour force participation as a ratio of the percentage of the total labour force. Male labour force participation rate is given as the percentage of male labour force participation as a ratio of the percentage of the total labour force. The total labour force participation rate is the number of people who are available or willing to work or have looked for a job recently as a percentage of the total population.
4.2 Unit Root Test Results

Table 2: Unit Root (Stationarity) Test.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Augmented (ADF) Test Statistics</th>
<th>Phillips Perron (PP) Test Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level (0)</td>
<td>First Difference (0)</td>
</tr>
<tr>
<td>RGDP</td>
<td>1.0303</td>
<td>-4.9243(0)***</td>
</tr>
<tr>
<td>FLFPR</td>
<td>-2.2092(1)</td>
<td>-0.9064(1)</td>
</tr>
<tr>
<td>MLFPR</td>
<td>-1.0081(1)</td>
<td>-3.6266(0)***</td>
</tr>
<tr>
<td>TLFPR</td>
<td>-1.5208(1)</td>
<td>-3.0342(0)**</td>
</tr>
</tbody>
</table>

Significance level: 1%, 5%, 10%

Note: The values presented in parenthesis in the ADF test are the selected delay lengths using the Schwarz Information Criterion (SCI) and the maximum delay length is 9. Optimal delay length, Newey-West Bandwith (Automatic Selection) criteria using Bartlett Kernel (default) spectral estimation method was employed in the PP test. ***, **, * indicate statistical significance at 1%, 5% and 10% levels respectively.

Following the results of the ADF, the series are a combination of I(0), I(1) and I(2). However, with the PP test statistics, the series are a combination of I(0) and I(1). Therefore, the ARDL border test is applicable.

Table 3: The Vector Auto Regression Analysis: Detection of Delay Length for Bound Test

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-115.6618</td>
<td>NA</td>
<td>0.020805</td>
<td>7.478863</td>
<td>7.662080</td>
<td>7.539594</td>
</tr>
<tr>
<td>1</td>
<td>106.7374</td>
<td>375.2987*</td>
<td>5.25e-08*</td>
<td>-5.421090</td>
<td>-4.505005*</td>
<td>-5.117434</td>
</tr>
<tr>
<td>2</td>
<td>117.6528</td>
<td>15.69085</td>
<td>7.60e-08</td>
<td>-5.103301</td>
<td>-3.454348</td>
<td>-4.556720</td>
</tr>
<tr>
<td>3</td>
<td>134.9480</td>
<td>20.53801</td>
<td>8.04e-08</td>
<td>-5.184249</td>
<td>-2.802428</td>
<td>-4.394743</td>
</tr>
<tr>
<td>4</td>
<td>146.3725</td>
<td>10.71052</td>
<td>1.42e-07</td>
<td>-4.898283</td>
<td>-1.783595</td>
<td>-3.865852</td>
</tr>
<tr>
<td>5</td>
<td>181.1881</td>
<td>23.93569</td>
<td>7.65e-08</td>
<td>-6.074255</td>
<td>-2.226698</td>
<td>-4.798899</td>
</tr>
<tr>
<td>6</td>
<td>208.3653</td>
<td>11.89005</td>
<td>1.14e-07</td>
<td>-6.772833*</td>
<td>-2.192409</td>
<td>-5.254552*</td>
</tr>
</tbody>
</table>

Note: * indicates lag order selected by the criterion, LR, FPE, AIC, SC, HQ indicate sequential modified LR test statistic (each at 5% level), final prediction error, Akaike information criterion, Schwarz information criterion respectively.

The Schwarz Information Criteria (SIC) is adopted in determining the delay length for the Bound test given that its optimal delay length is 1 when the maximum delay length is 6. There is therefore no auto correlation as SIC takes the minimum value.

Table 4: ARDL Bound Result (Conditional Error Correction Regression)

<table>
<thead>
<tr>
<th>Variable (Long run)</th>
<th>Coefficient</th>
</tr>
</thead>
</table>

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Table 5: Criteria Graph for Model Selection Summary

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tlfp</td>
<td>-0.0618</td>
<td>(0.0757)</td>
</tr>
<tr>
<td>Mlfp</td>
<td>0.0086</td>
<td>(0.0201)</td>
</tr>
<tr>
<td>Flfp</td>
<td>0.0147</td>
<td>(0.0093)</td>
</tr>
<tr>
<td>Lnrgdp(-1)</td>
<td>-0.0710</td>
<td>(0.0654)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.4781</td>
<td>(1.7924)**</td>
</tr>
</tbody>
</table>

**Short run**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tlfp</td>
<td>-0.0618</td>
<td>(0.0619)</td>
</tr>
<tr>
<td>Mlfp</td>
<td>0.0086</td>
<td>(0.0159)</td>
</tr>
<tr>
<td>Flfp</td>
<td>0.01469</td>
<td>(0.00662)**</td>
</tr>
<tr>
<td>Lnrgdp(-1)</td>
<td>0.9289</td>
<td>(0.0622)***</td>
</tr>
<tr>
<td>Constant</td>
<td>4.4781</td>
<td>(1.6146)***</td>
</tr>
</tbody>
</table>

| ECT        | -0.0710     | (0.0116)**     |

### Diagnostic tests

- $R^2 = 0.989$
- $\bar{R}^2 = 0.987$

F-statistics: $709.182$ (0.0000), $DW = 2.03$

Source: Researchers’ compilation. Note: Tlfp, Mlfp, Flfp, Lnrgdp(-1) represent total labour force participation, male labour force participation, female labour force participation, lag of natural logarithm of real gross domestic product. Standard errors are given in parenthesis. For the F-statistics, the p-value is given in the parenthesis.
The best long-term model going by the SIC is the non-correlated ARDL (1,0,0,0) of the 20 most appropriate ARDL models for the long-term analysis.

Figure 1: Bound Test Parameter Stability tests: Cusum and CusumQ

Schwarz Criteria (top 20 models)
The model’s CusumQ indicates that the constant term of the regression equation is stable over time.

### 4.3 Empirical Results

The empirical analysis focuses on the ARDL model employed for this study. The results from the ADF unit root test revealed that the level of integration is mixed at I(0), I(1) and I(2) while the PP test revealed that the level of integration was mixed at only I(0) and I(1). The PP unit root test therefore reaffirm the appropriateness of the bound test as the preferred estimation framework employed for this study.

The lag length selection based on the different criteria when the maximum delay length is 6 shows the Schwarz Information Criteria (SIC) taking the minimum value and indicating no autocorrelation. The F-statistics from the Unrestricted Error Correction Mechanism (UECM) indicates that there is level relationship among the series in the steady state given that the calculated F exceeds the upper bound at 1 percent conventional level. Given the maximum latency of 6, the most appropriate long-term model according to the SIC is the non-autocorrelated ARDL (1,0,0,0) model. The graph of the 20 best ARDL models for steady state analysis is presented in table 6.

The long-term relation was estimated using the ARDL-bound test and the result of the optimal delayed long term ARDL model (1,0,0,0) is presented in table 3. In the short-term, the relationship between RGDP and TLFP remains insignificantly negative, RGDP and MLFP insignificantly positive, RGDP and FLFP significantly positive at the 5 percent conventional level and RGDP and DLNRGDP statistically significant and positive at the 1% conventional level.

A percentage increase in TLFP will generate a deteriorating impact on RGDP coefficient of about 0.062 percentage points while a one percentage increase in MLFP and FLFP will lead to about 0.009 and 0.015 percentage points increase in the RGDP coefficient. A marginal change in RGDP will result to about 0.929 percentage points increase in the RGDP coefficient.

In the long-term, the coefficient of TLFP continued to have a negative and insignificant impact on RGDP with the same coefficient as that of the short-term period. The long-term coefficients of MLFP and FLFP continued to be the same as that of the short-term values. The coefficient of MLFP continued to be insignificantly positive in the long-term with the coefficient of FLFP having a positive but insignificant relationship with RGDP.

A percentage increase in TLFP will result into a 0.0618 percentage points reduction in RGDP, that of MLFP will lead to a 0.0086 percentage points increase in RGDP, that of FLFP will result into a 0.0147 percentage points...
points increase in RGDP, and a marginal change in RGDP will lead to a reduction of 0.071 percentage points in RGDP.

Nevertheless, there is need for the establishment of cointegration to ascertain the validity of the steady state estimates. This cointegration is established adopting a test based on the speed of adjustment or error correction concept. The coefficient estimate from the EC is determined from the model to generate the error correction term labeled ECT. A significant negative coefficient obtained for the ECT indicates evidence of cointegration which is the case of the model employed in this study. The size of the coefficient implies that 0.071% of adjustment takes place in a year.

5.0 SUMMARY AND CONCLUSION

This paper investigated the implications of women in STEM on growth in Nigeria. Annual data from 1980 to 2017 involving female labour force participation rate, male labour force participation rate and total labour force participation rate was collated and real gross domestic product was employed as a proxy for growth in the country. The existence of cointegration was established between RGDP and the control variables and on this basis, the long and short-term autoregressive distributed lag (ARDL) model was employed to account for any potential non stationarity in the model.

Furthermore, the contributions of the total labour force employing the total labour force participation rate on economic growth was considered and the comparison of female labour force participation rate and male labour force participation rate on economic growth in the country was undertaken.

Analysis of the short-term reveal that the error correction coefficient of the model was negative and statistically significant at the conventional levels, implying that short-term deviations are close to long-term equilibrium values.

The long-term results of the ARDL model adopting the SIC model selection method, automatic lag selection and the HAC Newey West coefficient covariance appear to be inconsistent. While there appear to be no difference between the short -term and long-term coefficients of TLFP and MLFP and their significances, the coefficients of the short-term and long-term values of FLFP while being the same and positive, is statistically insignificant in the steady state.

With women constituting 49.5% and men constituting 50.5% of the population (Nigeria Bureau of Statistics 2015), increasing female employment in STEM in the economy is as relevant as male employment in order to hasten the pace and distribution of growth in the country.

In conclusion, the study highlights the implications of women in STEM on growth in Nigeria using the ARDL-bound test. The results reveal that female labour force participation rate and male labour force participation rate exert positive impact on economic growth both in the short-term and long-term and that economic growth can be stimulated through the adoption of short-term and long-term policies.

Total labour force participation rate on the other hand indicates a negative and constant relationship with real gross domestic product both in the short-term and the long-term. This calls for the adoption of policies to provide training, workshops and seminars for the total labour force in the economy in order to improve the quality of their output which has implications for steering the pace and distribution of income in the economy. Also, imperative for policy makers to ensure a positive relationship between real gross domestic product and total labour force participation is the improvement in the human capital measured in terms of nutrition, education and health of the working population as well as improvement in their quality of life and well-being.

Scholarship opportunities in STEM should also be increased to female aspirants to increase female participation in the fields. Role models should also be encouraged to hold discussion with female students and encourage them to pursue professions in STEAM. There is also the need to enlighten females right from adolescence and possibly childhood on the adverse impacts of stereotypes, lack of confidence, self-esteem and male chauvinism.
Further studies can also look into the interaction between education and labour force participation rates in the economy, precisely female labour force participation rate relative to male labour force participation rate and implications for growth in the country.

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INFLUENCE OF WORK-LIFE BALANCE ON ORGANISATIONAL COMMITMENT OF WOMEN EMPLOYEES’ IN SOME SELECTED BANKS IN AFIKPO NORTH LOCAL GOVERNMENT EBONYI STATE

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ABSTRACT
The study investigated the influence of Work-Life Balance on organisational commitment among women employees in the Nigerian banking industry. This is because women are playing an important role in the organizational performance and family well being. This study utilized descriptive research procedure to accomplish the purpose of the objective. The population consists of women employees who had completed two (2) years of experience and who are currently working in Afikpo North Local Government Area of Ebonyi State. The questionnaire consist thirteen statements which were used for collection of data from Fifty (50) women employees from selected banks in Afikpo North Local Government Area, Ebonyi State. The data collected was analysed using the mean method. A mean score of 2.50 and above was taken as an index of accepted while a mean score below 2.50 was taken as an index of rejected. On the basis of the results, it was observed that women employees in the banking sector are able to manage their work and family effectively. It was also revealed that work is interfering with their family life at higher level but, they perceived family interfering with their work life at lower level. Work-life balance and organisational commitment are having positive relationship. It is therefore recommended that organisations should allow for proper work-life balance practice in an organisation as it is a means of achieving better employee commitment and productivity for the organisation.

Keywords: Work-Life Balance, Organisational Commitment, Women Employees, Work-Interference, Family-Interference

1. INTRODUCTION
Nowadays, women employees in the banking sector are confronting great competition and scarce resources than ever before. They are also severely challenged by the external and internal environment to achieve their goals effectively and efficiently. Women employees in the banking sector are playing an important role in determining the productivity and profit maximization in the organisation. It is argued that they have the potential to be part of solutions to key problems in commercial banks in Nigeria. Work-life balance and organisational commitment for women employees in the banking sector are paramount importance for them because, they women are playing crucial role in their organisations performance and their family well-being.

According to Liff and Ward (2001), Work and family are most important domains in lives. The two roles are often in conflict work and family. Work has to do with long hours, reduced presence at home, missed activities while family with work has to do with child illnesses and absenteeism. The more job involvement, the higher the work-family conflict and this lead to increased burnout, lack of job satisfaction, and reduced commitment. The more preoccupied and reduced effectiveness due to that preoccupation, the higher the work-family conflict. There is a disproportion in the degree of conflict reported by gender. It is noted that as experience grows, regardless of gender, work-life conflicts decline (Sturges and Guest 2004). Those who are work-oriented make accommodations that meet their need for challenges while allowing for career enrichment and those who are family-oriented will seek accommodations to minimize conflicts with family requirements (Sturges and Guest 2004).
Organisational Commitment

In the present dynamic environment there is no organization that can perform its obligations efficiently and effectively, unless its employees are committed or loyal to the goals and objectives of the organization. Anam, Muhammad, and Rab (2015) stated that employees’ commitments are the desire of the employees for the success of the organization believing that staying at the present place of employment is best alternative.

Dick (2011), defined organizational commitment is an attitudinal or emotive dimension of work motivation, manifesting its form in members’ behavior. Thus, organizational commitment is a subset of employee commitment, which is comprised of work commitment, career commitment & organizational commitment. Organizational commitment is defined as “an employee's feelings about their job, organizational identification and the degree to which an employee experiences a ‘sense of oneness' with their organization. Another definition is “Strength of the feeling of responsibility that an employee has towards the mission of the organization (Behav, 2010).

According to Ongori (2007) organisational commitment is the positive response an employee has towards the internal and external working environment and benefits such empowerment, compensation and job enrichment prevalent in their organization. Anthony (2017) observed that organisational commitment is all about giving employees enough facilities, training autonomy, responsibilities and adequate resources to make them perform better and serve organization better. Also, a fair and transparent treatment should be given to all employees irrespective of their ages groups and experiences.

Anthony (2017) believed that committed employees develop bonds with their organizations which lead to feasible organizational performance. In addition, hence, successful organizations rely on the maximum inputs of their employees to achieve their strategic objectives as well as competitive advantage (Dessler, 2011).

Meyer and Allen (2012) divided employee’s commitment into three parts: affective, continuance and normative commitments. Affective commitment or emotional attachment to the organization is the believe of the employees on organization’s goals and values such as like or feels the organization; Continuance commitment is the costs (i.e. friendships with colleagues in the workplace etc), of leaving the organization, therefore, an employee may not want to leave the organization due to high costs of losing organizational membership; and normative commitment is when an employee decides to stay in an organization due to feelings of obligation because the organization might have spent a lot of money in training the employee either locally of internationally and therefore the employee deem it necessary to work for the organization because he/ she “ought to” or staying is the right to do.

Work-Life Balance

The term work-life balance is commonly used as a more comprehensive expression to describe policies that have been previously termed 'family-friendly', but are now extended beyond the scope of the family. Work-life balance refers to the flexible working arrangements that allow both parents and non-parents to avail of working arrangements that provide a balance between work responsibilities and personal responsibilities (Redmond Valiulis and Drew, 2006).

According to Clarke, Koch and Hill (2004), work-life balance is generally associated with equilibrium between the amount of time and effort somebody devotes to work and personal activities, in order to maintain an overall sense of harmony in life. To understand work-life balance, it is important to be aware of the different demands upon us and our personal resources- our time and our energy- that we can deploy to address them. Research has indicated that those workers who have some form of control over their working environment tend to suffer less stress-related ill-health, with clear implications for the concept of work-life balance Organizations can implement various work-life balance initiatives that may assist employees to better balance their work and family responsibilities, gain improvements in well-being and provide organizational benefits. There are large varieties of family friendly policies which include, but are not limited to the following: flexible working hours, job sharing, part-time work, compressed work weeks, parental leave, telecommuting, on-site child care facility (Norton2000).

Work Life Balance proposed by Fapohunda (2013) would be adopted because it is broad and encompassing “Employers working constructively with their employees to put in place arrangements, which take into account the needs of the business as well as the non-work aspects of employees’ lives” Barrera (2007). It comprise of both employees and employers who are both central to the subsequent use and successful implementation of Work Life Balance policies and practices. This can only be achieved as a joint effort between employers and employees.

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**Benefits of Work-Life Balance Policies to Organisations and Women Employees**

According to Hudson Resourcing (2005), the effects of introducing work-life balance practices on employee attitudes and perceptions include job satisfaction, organizational commitment, job stress and turnover intention. All of these factors, in turn, affect job performance, direct and indirect absenteeism costs, costs associated with the loss and replacement of valued employees, customer satisfaction, and organizational productivity; Although the formal evaluation of work-life practices is often difficult because of the problem of calculating the costs and benefits of different strategies, some companies have attempted to quantify the outcomes of specific policies. The most commonly used measures of organizational outcomes include the follow:

**Benefits to Organization**
- Reduce absenteeism and lateness
- Improved productivity
- Increased retention of valuable employee
- Employee loyalty and commitment
- Enhanced organizational image

**Benefits to Employee**
- Increased job satisfaction
- A greater sense of job security
- Better physical and mental health
- Enhanced control over work-life environment
- Reduce job stress levels

**SOURCE:** Hudson Resourcing (2005)

**Relationship between Work-Life-Balance and Organisational Commitment**

Under this section, existing studies were reviewed to support and refute the relationship between work-life balance and organizational commitment. In the United States of America, Malone and Issa (2012), investigated the relationship between work-life balance and organizational commitment of women in the US construction industry. They found that there were differences in their respondents’ commitment over different time intervals, as well as in their satisfaction with employer benefits based on whether or not they had children under 21 living at home. In India, Azeem and Akhtar (2014) for instance, found a significant relationship between healthcare employees’ work-life balance and their commitment. Based on the result of their regression analysis, they held that work-life balance contributes 37% variance to the health workers’ satisfaction and organizational commitment. Similarly, Tayfun and Çatir (2014) in their study, found a positive relationship between work-life balance of nurses and affective and normative commitment, was found no relationship between work-life balance and continuance commitment. Also, using the canonical analysis, Benligiray and Sönmez (2012) result revealed that the relationship between doctors and nurses’ organizational

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commitment and work–family conflict is weak and positive. More recently, Choo, Desa and Asaari (2016) employing the correlational and linear regression approach of the quantitative research design found that flexible working arrangement was significantly and positively related to organizational commitment. In the correlational study of Ch, Kundl, Qureshi and Akhtar (2014), they observed that a significant relationship exists between work-life balance and organizational commitment.

Within the Nigerian context, Akintayo (2010) found a significant relationship between work–family role conflict and organizational commitment amongst industrial workers in Nigeria using the linear regression. Also, Babolola, Oladipo and Chovwen, (2015), in their study on the influence of organizational factors and work-family conflict on organizational commitment among working parents, observed that employees with high work-family conflict are more committed to their jobs. This result is inconsistent with the work of Good, Sisler and Gentry (1988) because, an employee that exhibits a high work-role and life-role conflict ought to be less committed to their organization because a negative spill-over effect exists.

Contrary to the findings above, Riaz and Hunjra (2015), in their study titled, evidence of organizational commitment and work-life conflict, the results of their study revealed a negative and significant impact of work-life conflict on organizational commitment. It was also uncovered that facets of work-life conflict also have negative and significant influence on organizational commitment. Also, Rehman and Waheed (2012)’s study on work-family conflict and organization commitment amongst faculty members at Pakistani universities, suggested a negative impact of work-family conflict on organizational commitment.

Relationship between Work-Interference with Family (WIF) and Organizational Commitment

The relationship between these variables has been understudied within the Nigerian context, most of the works on this relationship were written in the developed countries, most especially, United States of America. Previous research studies who used United States of America participants found that work interference with family (WIF) negatively relates to affective commitment (Salvaggio, 2008) and positively relates to continuance commitment (Casper, Martin, Buffardi & Erdwins, 2002). It is against this backdrop that; this study sets out to fill the glaring lacuna.

Relationship between Family-Interference with Work (FIW) and Organizational Commitment

Casper, Harris, Taylor-Bianco and Wayne (2011) observed that, research on the relationship between family-interference with work (FIW) and organizational commitment is less well developed than that on work-interference with family (WIF). Earlier studies found mixed results with respect to this relationship. Some studies have found a negative relationship between work-interference with family (FIW) and affective commitment (Netemeyer 2012); others have found no relationship. Also, Casper et al., (2002) found no relationship between Family-Interference with Work and continuance commitment.

Hence, the study aimed to examine the effect of Work-Life-Balance on organisational commitment of women employees in the banking sectors and how well managed Work-Life-Balance change the level of commitment women employees in the banking sectors in Nigeria.

Statement of the Problem

The Nigerian working environment has been observed to be volatile, degrading, precarious and unfriendly for women employees in the Banking sectors. Also, in the banking environment, work-life imbalances have become a common occurrence and have numerous consequences on organisations such as low productivity and growth trajectory. These work-life imbalances can lead to the non-commitment of women employees because a non-alignment exist between their roles at work and roles at home. Commitment of employees is important for achieving organisational efficiency in Nigeria’s dynamic work environment. This is because women employees’ have various roles to play at-work and at-home and they must effectively manage these roles, in other not to lead to employees burnout. This study tends to critically investigate into the role of Work-Life Balance in achieving organisational commitment of women employees in the banking industry considering all relating justification to Nigerian context.

Objectives of the Study

The main objective of this study is to investigate into the role of Work-Life-Balance as a predictor in achieving organisational commitment among women employees in Nigerian banking industry.

The specific objectives are to:

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1. Determine the relationship between work-life-balance and organisational commitment

2. Investigate the relationship between Work-Inference with family (WIF) and organisational commitment

3. Examine the relationship between Family-Interference with work and organisational commitment.

**Research Questions**

12. To what extent does work-life-balance influence the organisational commitment women employees in the Nigerian Banking Industry?

13. Does Work-Interference with family affect organisational commitment of women employees in the Nigerian Banking Industry?

14. Does Family-Interference with Work influence organisational commitment of women employees in the Nigerian Banking Industry?

2. **METHODOLOGY**

The study employed the descriptive survey method. This method was used because it gives greater room to study the subject matter and ensures that inferences can be made about some characteristic attitude or behaviour of the population in the study. The population of this study consists of employees of some selected banks in Afikpo North Local Government of Ebonyi State. The study sampled fifty (50) women employees from First Bank Plc, Wema Bank Plc, Eco Bank Plc, Zenith Bank Plc and Fidelity Bank Plc. First Bank Plc (10), Wema Bank Plc (10), Eco Bank Plc (10), Zenith Bank Plc (10) and Fidelity Bank Plc (10). The choice of simple random sampling techniques gave the population equal chance of being included in the research study. A structured Questionnaire which is divided into two sections was used to elicit response from the respondents. Section A comprise of the demographic information of the respondents while section B consist of the research questions. The data collected were analysed using the arithmetic mean and a mean score of 2.50 and above was taken as an index of accepted while a mean below 2.50 was taken as an index of rejected.

3. **DATA PRESENTATION AND ANALYSIS**

Table 1: To what extent does Work-Life Balance influence the organisational commitment of Women employees in the Banking Sector?

<table>
<thead>
<tr>
<th>No</th>
<th>Statement</th>
<th>Agreed</th>
<th>Disagreed</th>
<th>Undecided</th>
<th>Total</th>
<th>Mean</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A good work-like balance helps retain women employees in the banking sector</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>3</td>
<td>Accepted</td>
</tr>
<tr>
<td>2</td>
<td>A good work-life balance provide a more effective and successful medical profession.</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>3</td>
<td>Accepted</td>
</tr>
<tr>
<td>3</td>
<td>There is Quality time between work and family</td>
<td>44</td>
<td>5</td>
<td>1</td>
<td>50</td>
<td>2.86</td>
<td>Accepted</td>
</tr>
<tr>
<td>4</td>
<td>I am able to have a fulfilling personal life and adequately perform my work responsibilities.</td>
<td>40</td>
<td>7</td>
<td>3</td>
<td>50</td>
<td>2.74</td>
<td>Accepted</td>
</tr>
<tr>
<td>5</td>
<td>Balance work demand without unreasonable</td>
<td>41</td>
<td>5</td>
<td>4</td>
<td>50</td>
<td>2.74</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

**Average Mean Score**

| 2.87 | Accepted |

**Source: Field Survey, 2019**

Table 1 above showed that statements 1-5 agreed with an average mean score of 2.87, which means that Work-Life Balance have positive influence on organisational commitment of Women employees in the Nigerian banking industry.

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Table 2: Does Work-Interference with Family affects organisational commitment of women employees in the Nigerian Banking Industry?

<table>
<thead>
<tr>
<th>No</th>
<th>Statement</th>
<th>Agreed</th>
<th>Disagreed</th>
<th>Undecided</th>
<th>Total</th>
<th>Mean</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>After work, I come home too tired to do some of the things I’d like to do</td>
<td>48</td>
<td>2</td>
<td>0</td>
<td>50</td>
<td>2.96</td>
<td>Accepted</td>
</tr>
<tr>
<td>7</td>
<td>On the job, I have so much work to do that it takes away from my personal interests.</td>
<td>42</td>
<td>6</td>
<td>2</td>
<td>50</td>
<td>2.8</td>
<td>Accepted</td>
</tr>
<tr>
<td>8</td>
<td>My family / friends dislike how often I am preoccupied with my work while at home</td>
<td>40</td>
<td>7</td>
<td>3</td>
<td>50</td>
<td>2.74</td>
<td>Accepted</td>
</tr>
<tr>
<td>9</td>
<td>My work takes up time that I’d like to spend with family/friends.</td>
<td>20</td>
<td>30</td>
<td>0</td>
<td>50</td>
<td>2.4</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2019

Table 2 above showed that statements 6-9 agreed with an average mean score of 2.73, which means that there is a work interference with family have an effect on the organisational commitment of Women employees in the Nigerian banking industry.

Table 3: Does Family-Interference with Work influence organisational commitment of women employees in the Nigerian Banking Industry?

<table>
<thead>
<tr>
<th>No</th>
<th>Statement</th>
<th>Agreed</th>
<th>Disagreed</th>
<th>Undecided</th>
<th>Total</th>
<th>Mean</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>My administration and peers dislike how often I am preoccupied with my personal life while at work.</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>3</td>
<td>Accepted</td>
</tr>
<tr>
<td>11</td>
<td>My personal life takes up time that I’d like to spend at work.</td>
<td>10</td>
<td>38</td>
<td>2</td>
<td>50</td>
<td>2.16</td>
<td>Rejected</td>
</tr>
<tr>
<td>12</td>
<td>My personal demands are so great that it takes away from my work.</td>
<td>38</td>
<td>12</td>
<td>0</td>
<td>50</td>
<td>2.76</td>
<td>Accepted</td>
</tr>
<tr>
<td>13</td>
<td>I’m often too tired at work because of the things I have to do at home.</td>
<td>46</td>
<td>3</td>
<td>1</td>
<td>50</td>
<td>2.9</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2019

Table 3 above showed that statements 9-13 agreed with an average mean score of 2.71, which means that there is a family interference with work have a significant impact on the organisational commitment of Women employees in the Nigerian banking industry.

4. CONCLUSION AND RECOMMENDATIONS

From the result above, it was observed that Work-Life balance and organisational commitment are having significant relationship. If women employees are having the good work life balance, they are more committed with their organisation. Hence, organisational should come forward to make their life is important and give due weightage on personal factors. Banks should treat their women employees the way they treat their customers. Even more in today ever challenges environment that demands are balancing of both work and life responsibilities. Also, from the study, a positive and significant relationship was noted between work-interference with family (WIF) and organizational commitment. Similarly, a positive and significant relationship was revealed between family-interference with work (FIW) and organizational commitment. This study therefore concludes that, Work-Life Balance pose a huge influence on organisational commitment of women employees in the Nigerian banking sector.
REFERENCES


CAUSES AND PREVENTION OF SUICIDE ATTEMPTS AND ACTIONS BY POLYTECHNIC FEMALE STUDENTS IN OGUN STATE

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ABSTRACT
The rate at which female youth attempt and commit suicide has become a serious challenge in the world that needs urgent and pragmatic solution. It is a fact that, suicide has become a common phenomenon among Nigerian youth, especially students in higher institutions of learning. Hence, the causes to this menace should be investigated so as to reduce and possible to stop it. This study through questionnaire and structured interview examined causes of suicide attempt among female students of Polytechnics in Ogun State and the need for pragmatic joint approaches proffer solution especially from women folks. Three hundred and fifty female students from 7 polytechnics in Ogun were used for this study. The study adopted the descriptive survey methods. Data collected was analysed using descriptive statistics of tables and percentages. The results from the analysis showed that female student commit suicide for many reasons among which are; poor parent-child relationship, poor academic performance, disappointments, sexual harassment, child abuse, and peer pressure group. Some of the methods being used for committing suicide are; drinking rat killer(sniper), using dangerous weapons (gun, knife, needle), by hanging, to mention few. The following recommendations among others were made; that parents especially mothers should create a very cordial relationship with their female students, etc. That the Government should engage these students because an idle hand is the devil’s abided, by empowering them.

Keywords: Causes, Female Students, Polytechnics, Solutions, Suicide Attempts

1. BACKGROUND OF THE STUDY

Human being device various means and methods to bail himself out of every problematic and challenging situations he find on his way at every difficult charged situations man find on his ways, there are always numerous ways out of solution performed by man. Man at times finds himself in difficulties that can be grouped under the social, financial, physical failures to mention a few.

Out of the myriads of solutions available to human beings, suicide has been one out of many solutions available. The history of suicide can be traced to the bible days when Judas Iscariot committed suicide after betraying Jesus Christ. He fell headlong to the hard ground when he realized that he was a betrayal, he therefore committed suicide in order to safe his face from nasty comments. Portes, etal(2002),defined Suicide has been defined as the killing of oneself after trying to solve some problems individuals believe they cannot surmount. It is morally and legally wrong for anyone to commit suicide; Suicide is not alien to any country, tribe or community and not limited to any group of people in respect of age, educational qualification or social strata.

Suicide has been attributed to certain factors which are social, psychological and phonological; most people who commit suicide inclined into solitary scenes when they are about to commit suicide.( Shain, 2007) Therefore suicide is defined as the act of voluntarily or intentionally taking of one’s own life, this definition did not specify the outcome of such acts, it is therefore not limiting or differentiating between fatal suicides and attempted or non fatal. History has it that suicide has been both condemned and praised by various societies. (Mayer & Ziain, 2002): It is condemned by all religious sects like Islam, Judaism and Christianity and any attempts are punishable by law in several countries. History also has it that, Vijayakumar etal. (2005), opined that Brahman of India tolerates it but however the involuntary suicide of an Indian widow made it outlawed but somehow involved praising at sometimes before. Also in ancient Greece, convicted criminals were allowed to commit suicide, when there were high incidences of committing suicide by the slaves, the Roman attitudes towards committing suicide was hardened through committing the act which deprived their owners of valuable property.
In Japan, the custom of seppuku also called hara-kiri or self disembowelment was practiced and accepted, the samurai were granted the option of punishing themselves in this way for wrong done and also used to escape the humiliation of failure to shame ones enemies or to demonstrate loyalty to a dead master or emperor which was also outlawed in 1873.

The western society has first used the canonic and later the criminal law to curb suicide. The French revolution of 1789 criminal penalties for attempting to commit suicide was abolished in European countries. England also followed suit in the year 1961. A number of theories have been developed to explain the causes of suicide. The psychological theory emphasizes personality and emotional factors, while sociological theories stress the influence of social and cultural pressures on the individuals committing suicide. Social factors such as widowhood, childlessness, residence in big cities, high standard of living, mental disorders and physical illness have been found to be positively responsible for committing suicide.

At the beginning of the year 2000, the incidences of suicide in Nigeria have been on the increase. Suicidal attempts by unemployed graduates, high class workers had been on the increase. Pages of newspaper, news bulletins and in the air are awash with news of various suicides either by jumping into the high sea, hanging or drinking poisonous substance. Between 2017 and 2019, the rates of suicide by female students have been on the increase on the pages of newspapers, bulletin, and the air waves are full of news of suicide by graduate and undergraduate female students. The reasons for this can be attributed to the following:

Sociological- Peer group influence, most students commit suicide if they believe they may or cannot cope with academics, friends including boyfriends and increase negative attitudes of parents.

Physiological- Unable to cope with the standard of living of peer groups, academic attendant, life styles of friends. Some physiological needs make many female students to commit or wanting to commit suicide and this include poisonous, either in class or among peer group.

Health- some undergraduates indulge in smoking and consumption of hard drugs which eventually affect their mental fitness. And in most cases peer group influence create room for females students to indulge in consumption of hard drugs.

There has been no single approach that has been declined to curb the high rate of act of suicide. In most cases it has been observed that the culprits reclined into themselves when about to commit the act of suicide. Some look for crevices or a closed environment to commit the act.

1.1 Statement of the problem

Suicide is an act of killing oneself intentionally. The suicide rate among female students has risen to an unprecedented level in our higher institutions. There are many reasons accredited to this sinful act but the major and viable reasons have not really been identified for proper solution to minimize or put a stop to this menace. Suicide is multi-dimensional phenomenon which has different meanings to students in different cultures and places. WHO studies in 2009 showed that adolescent people are often at risk and suicide is the second to the largest causes of mortality in Nigeria. Also in Iran, a systematic review of the research on suicide and attempted suicide showed that attempting suicide is prevalent among adolescents. Haghighal et al(2013), on the epistemology of pediatric acute poisoning in Shiraz found out that the prevalence of attempting suicide by female students was estimated to be 38.5% which was significant increase compared to that report in previous study in 2005 which was 15.8%.

1.2 Significance of the work

A democratic government of any nation will always want the best for its citizen and work towards developing the country in terms of structures, economy and human resources. It is the belief of the researchers that the outcome of this research work will serve as working tools for both the government to protect its citizens. Parents to care for their children and give parental guides, monitoring and advises. Also female students and other youths will benefit other stake holders in health sector and social ministries of government with the whole citizens of the nation will not be left out.

1.3 Objectives of the work

The research work has the following research objectives to find out the cause of female students’ suicide attempts and actions.

✓ To find out their reasons for committing suicide.
✓ To find out the prevailing methods of committing suicide by female teenagers.
✓ To know the likely negative effects of such on the female polytechnic students.

1.4 Research questions

The under listed questions will guide the collections of responses for data analysis on this work..

1. What are the causes of female suicide actions?
2. What are the reasons for committing suicide by female polytechnic students?
3. What are the methods used by female polytechnic students to commit suicide?
4. What is the age range of the students committing suicide?
5. What are the possible solutions to female students’ suicide actions?

2. LITERATURE REVIEW

The world order has been battling the case of suicide among her citizens, the news is afresh with notes of committing suicide, and it is a global health problem. Vijayakumar (2015), asserted that approximately one million individuals die through suicide, while 10-20 million individuals attempted suicide and 50-120 million are affected by the suicide or attempted suicide of a close relative or associate. She affirmed that Asian countries 60million people are affected by suicide or attempted. The world population has increased to 7.7 billion this year and so there must have been increase in the number of suicide or attempted suicide commission.

The role and behaviors of man and woman to everyday issues differs in all ramification, the way and manners with which crises are reviewed and comprehended differs greatly in both men and women. As some women or ladies are masculine in nature, there are still rooms for misconception of ideas, as such there are differences in the roles, responsibilities, status and power and these socially constructed differences interest with biological differences that contribute to differences in suicidal behavior of man and woman.

As asserted in this writing, the rates of suicide in most countries are higher in males than in females. China is one important exception with higher rates in female, Tam Cai-Lian (2011) especially young women in rural China. In Nigeria, with a population of about 200 million people, the suicide rates among young undergraduate students are in the increase. The WHO (World Health Organization) records that Nigeria is the 5th country with the number of undergraduate committing suicide.

Schwartz (2011) gave Dialectical Behavior Therapy (DBT) as a therapy that can be used to help an individual recognize disruptive or unhealthy feelings or actions. In relation, this therapy method then introduces techniques on how to deal with difficult or troubling situations. More research is needed on psychotherapy related to suicide prevention though, as DBT in particular has been shown to decrease the prevalence of attempted suicide but has shown no effect on completed suicides.

Cantor & Veulinger (2000), affirmed that medications can also be prescribed as prevention method to suicide; however, controversy exists in this method, as many medications used in the treatment of mental disorders include increased risk of suicide as a side effect. He also agreed that increased awareness among doctors is again a preventive technique to suicide.

Research indicated that many individuals who have completed suicide or attempted suicide did seek medical attention in the year prior; however, warning signs may have been missed. Increased education and awareness among medical professionals might decrease suicide rates in the future. Kwok SY, Shek DT

Gregory (2019), affirmed that mental disorders play an overwhelming role on the increase rate of suicide; he identified an assisted suicide as a controversial topic in the medical field and this asserted that an individual helping another individual in committing suicide by providing them with the means to carry it out or by providing ways and methods to use. It was also confirmed by Gregory that the most risk factors of suicide include psychiatric disorders, genetics substances, abuse family and social situations, in most countries psychiatric factors and abuse of drugs co-exist. Mental disorders play an overwhelming role in the increased risk of suicide with estimate of up to 90% of individuals who take their own life as a result of psychiatric disorder; but the risk of suicide for individuals suffering from mental disorder have drastically reduced due to effective treatment. It was also confirmed by Gregory that depressive disorder, bipolar disorder and substances abuse ranks in the second highest risk factors for suicide. Along with these factors of depressive disorder, bipolar disorder are; Schizophrenia, personality disorder, post-traumatic stress disorder and eating disorders, also confirmed in that individual suffering from major depressive disorders and bipolar disorder are at the highest risk of suicide.
These factors are prevalent in almost all individuals in every country committing suicide. Also responsible for suicide, is broken home or relationship. The available data affirmed that Equatorial Guinea ranks 7th in the world highest rate suicide country followed closely by Cote d’Ivoire 8th and 9th Angola to mention few. Kiunquyu (2017), affirmed that risk factors for suicide vary according to age by age, gender and ethnic group. He affirmed that large percentage of people that committing suicide has clinical depression or another mental disorder. Some of the factors highlighted are associated with attempted suicide or committing suicide. It is also affirmed by Kiunquyu that males always commit suicide by hanging, carbon-monoxide poisoning and firearms, but in Nigeria today it’s either by hanging, drowning or use of hard substances. Professor Deshapande of Auburn of University USA a psychiatric asserted that suicidal desire generally leads to decisive fatal action in males while in females it manifest as depression, ideation and generally non-fatal actions.

Tam et.al (2011), confirmed that teenage suicide occurs in every corner of the world; it is a very serious problem. The report of a newspaper in Malaysia, Nanyang Siang Pao (2010), affirmed that there was 445 suicidal cases where 347 were males and 98 were females, also confirmed were suicidal cases of ages 30-39 years which amounted to 109 cases of 20-29 years old which also amounted to 108 cases; the report further revealed that suicidal acts are culture bound in most cases linked to suffering from perceived burden on someone which includes emotion, study and work. Tam also asserted that suicide occurs throughout the world in different ways; various studies conducted to examine the relationship of suicidal behavior and the rates of suicidal attempts which the demographic factors such as sex/gender, race/ethnicity, age and marital status. In the United States, males commit suicide more than three times compared to the females (Keyvanara & Haghshenas, 2011)

Alake (2018), affirmed that Nigeria is ranked 5th on annual suicide list, Nigeria placed fifth with 15,000 suicide in every 100,000 suicides. The list was topped by South Korea with 24,000, followed by Russia with 18,000 then India with 16,000 and Japan with 15,400.

It was also confirmed that factors such as terminal disease can lead to resignation and then suicide, it’s a common knowledge that 90 percent of people who commit suicide suffer from mental illness, and other factors identified include sickness 26%, poverty 24%, and malnutrition 7%. Nigeria is termed to be a highly volatile country where hardships are part of everyday life, a significant number of Nigerians live below the minimum wage of #18,000 and the intending #30,000.

Bazrafshan (2016), concluded that family is very influential in the life of adolescent. He gave emotional distance between adolescents and their parents, weak communication and conflict between parent and adolescent child, and significant changes in the family, such death of parents, parents’ divorce that could lead to living with step-parents are some of contributing factors to adolescents’ attempting or committing suicide. Out of the myriad advises suggested include regular examination, companionship of friends and members of the family, regular employment and content, regular communication with the individual concerned and noticed.

Ellien (2002), gave the following as campus environmental protective factors that can be used to prevent attempts and actions on suicide

- Implement regular screening programmes for depression and other serious mental illness and suicide related behavior
- Provide educational programmes and materials to parents and to families of incoming and old students
- Take a campus-wide approach to address both individual and environmental factors associated with suicide
- Reach out to students when their symptoms are just developing to fewer students and up at risk for serious depression
- Develop a continuum of activities to decrease risk factors and increased protective factors
- Establish past-bention programmes to help the community cope after a suicide death on campus
- Develop comprehensive medical leave policies, which include mental illness
- Participate in statewide surveillance system for reporting suicide deaths and serious suicide-related behaviour on campus

Pelkonem & Marltunen (2003) suggested that there is no need for campus protective factors for students in higher institutions for preventing suicide attempts and actions. The suggested factors are; need for strong connections to family and community support, need for relationships, need for skills in problem solving.

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conflict resolution and non-violent handling of disputes and the urgent used for cultural and religious beliefs that discourage suicide and support self preservation.

3. RESEARCH METHODOLOGY

This research adopts the survey method in sampling and data collection. The data collection instruments for the research work are questionnaires and structured interview. Four (4) points Likert scale (strongly agreed, agreed, strongly disagreed, and disagreed) was use to get responses for the questions asked. 385 respondents were administered, on from each of the polytechnic female students understudy. However, 350 were retrieved and found useful for the analysis. While the data collected was analysed using descriptive statistics of tables and simple percentages.

All researches have its scope and limitations, the scope of study for this work is ‘Causes and Prevention of suicide attempts and actions among female polytechnic students in Ogun state’, the reasons, factors responsible with preventive ways were discussed. Since it is not possible for any research work to cover the entire research population, the target populations are the female students in 7 polytechnics which are; The Federal Polytechnic, Ilaro, Moshood Abiola Polytechnic, Ojere, Abeokuta, ICT Polytechnic, Ibesa, ICT Polytechnic Adegbenro Polytechnic, Itori, Abraham Adesanya ICT Polytechnic, Ijebu Igbo and All Over Polytechnic, Sango Otta. These Polytechnics were used to represent all polytechnics in Nigeria, because the researcher cannot go round all polytechnics in the cause of doing this research. Apart from the above mentioned limitation, the researcher was also faced with financial constraint which of cause is the fuel to completing researches.

4. DATA ANALYSIS AND INTERPRETATION

1. Figure 1. Sources of ideas to commit suicide.

<table>
<thead>
<tr>
<th>S/N</th>
<th>OPTIONS</th>
<th>SA</th>
<th>A</th>
<th>SD</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Television</td>
<td>50 (14.3%)</td>
<td>70 (20%)</td>
<td>170 (48.6%)</td>
<td>60 (17.1%)</td>
</tr>
<tr>
<td>2</td>
<td>Movies</td>
<td>225 (64.3%)</td>
<td>75 (21.4%)</td>
<td>15 (4.3%)</td>
<td>35 (10%)</td>
</tr>
<tr>
<td>3</td>
<td>Peer pressure</td>
<td>197 (56.3%)</td>
<td>83 (23.7%)</td>
<td>45 (12.8%)</td>
<td>25 (7.2%)</td>
</tr>
<tr>
<td>4</td>
<td>Parents/Guidance</td>
<td>42 (12%)</td>
<td>15 (4.3%)</td>
<td>199 (56.9%)</td>
<td>94 (26.8%)</td>
</tr>
<tr>
<td>5</td>
<td>Friends</td>
<td>20 (5.7%)</td>
<td>30 (8.6%)</td>
<td>175 (50%)</td>
<td>125 (35.35.7%)</td>
</tr>
<tr>
<td>6</td>
<td>Social Media</td>
<td>208 (59.4%)</td>
<td>120 (34.3%)</td>
<td>17 (4.9%)</td>
<td>5 (1.4%)</td>
</tr>
</tbody>
</table>

In the figure above, where do polytechnic female students get the idea to commit suicide, 50 (14.3%) strongly agreed to television as the source, 70 (20%) agreed while 70 (48.6%) and 60 (17.1%) strongly disagreed and disagreed respectively. On movies as source for getting idea to committing suicide, 225 (64%) and 75 (21.4%) respectively strongly agreed and agreed while 15 (4.3%) and 35 (10%) respondents strongly disagreed and disagreed respectively. Peer pressure, 197 (56.3%) and 83 (23.7%) respondents strongly agreed and agreed respectively that peer pressure is a very common and easy way of getting idea to commit suicide while 45 (12.8%) and 25 (7.2%) respondents strongly disagreed and disagreed respectively. On whether friends are the source of getting ideas for committing suicide by female students, 20 (5.7%) respondents strongly agreed, 30 (8.6%) agreed but 175 (50%) and 125 (35.35.7%) respondents vehemently disagreed to friends being source of committing suicide. It was also found out that 42 (12%) and 15 (4.3%) respondents responded in affirmative to parents/guidance being a source to committing suicide, while 199 (56.9%) and 94 (26.8%) respondents respectively strongly disagreed the source being parent/guidance. Social media has 208 (59.4%) and 120 (34.3%) gave strongly agreed and agreed that social media is a major source while 17 (4.9%) and 5 (1.4%) gave strongly disagree and disagree to the notion.

Invariably from the data interpreted, it was deduced that movies has the highest score 300 (85.7%) for respondents who agreed to it as a source where female polytechnic students get ideas on committing suicide, this is strictly followed by social media with 320 (93.7%), while peer pressure has 280 respondents of (80%). It shows that respondents can get the idea to attempt and commit suicide majorly from these three ways.
Fig. 2: Vulnerable ages to suicide.

<table>
<thead>
<tr>
<th>S/N</th>
<th>OPTIONS</th>
<th>SA</th>
<th>A</th>
<th>SD</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15-20</td>
<td>23</td>
<td>20</td>
<td>215</td>
<td>92</td>
</tr>
<tr>
<td>2</td>
<td>21-25</td>
<td>219</td>
<td>122</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>26-30</td>
<td>209</td>
<td>109</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>31-35</td>
<td>15</td>
<td>75</td>
<td>135</td>
<td>85</td>
</tr>
</tbody>
</table>

Fig 2: on the age group that are vulnerable to commit suicide, age 15-20 has 23 (6.5%) and 20 (5.9%) respondents respectively who strongly agreed and agreed with age range mentioned above. 21-25 years of age has 219 (62.6%) and 122 (34.8%) in affirmation for the respondents who disagreed with 21-25 age range for committing suicide. Ages 26-30 has 209 (51.7%) 109 (31%) respondents in agreement while 12 (3.4%) and 20 (5.9%) respondents respectively did not agree.

Age 31-35 has 55 (15.7%) and 75 (21.4%) agreed respectively that 31-35 years of age can commit suicide, while 130 (38.6%) and 85 (24.3%) respondents did not agree. However during personal interview, some respondents said that ages 31-35 may have graduated from polytechnics, therefore they may not be students any longer but Nigerian youth.

It was deduced that most age ranges that are vulnerable to committing suicide are between ages 20-35, it is from this age that disappointment, abandonment, academic failure becomes meaningful to their future and existence and they are desperately looking for means of getting out of it by resulting to attempting and committing suicide.

Fig 3: Reasons for committing suicide.

<table>
<thead>
<tr>
<th>S/N</th>
<th>OPTIONS</th>
<th>SA</th>
<th>A</th>
<th>SD</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disappointment</td>
<td>115</td>
<td>122</td>
<td>68</td>
<td>45</td>
</tr>
<tr>
<td>2</td>
<td>Hopelessness</td>
<td>132</td>
<td>158</td>
<td>38</td>
<td>22</td>
</tr>
<tr>
<td>3</td>
<td>Abandonment</td>
<td>107</td>
<td>79</td>
<td>78</td>
<td>86</td>
</tr>
<tr>
<td>4</td>
<td>Academic Failure</td>
<td>224</td>
<td>76</td>
<td>26</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>Parental Attitudes</td>
<td>189</td>
<td>96</td>
<td>37</td>
<td>28</td>
</tr>
</tbody>
</table>

Fig 3: respondents were asked the reasons for committing suicide and the following reasons were gotten. 115 and 122 respondents of (32.9%) and (34.9%) respectively strongly agreed and agreed that disappointment is one of the strong reasons why female polytechnic students commit suicide while 68 of (19.4%) and 45 (12.8%) respondents gave strongly disagreed and disagreed to disappointment as a key reason for committing suicide.

Hopelessness was again seen as an issue to committing suicide because 132 (37.7%) respondents and 158 (45.1%) respectively strongly agreed and agreed to it as a factor to committing suicide while 38 (10.9%) respondents and 22 (6.3%) vehemently disagreed.

On if academic failure is a reason for committing suicide, 224 respondents of (64%) and 76 (21.7%) strongly agreed and agreed respectively while 26 (7.4%) and 24 (6.9%) respondents respectively objected to academic failure being a reason for committing suicide by polytechnic female students. Parental attitudes towards their children was also strongly agreed to by 189 (54%) respondents and 96 (27.4%) respondents while 37 (10.6%) and 28 (8%) objected to parent attitudes towards committing suicide. Abandonment is the last option from this figure and it has affirmation of 107 (30.6%) and 79 (22.6%) while 78 (22.3%) and 86 (24.5%) did not agree.

From the figure above, it was confirmed that, there are many reasons responsible for female polytechnic students to commit suicide. Some of which are: disappointment from any angle, hopelessness, abandonment, parental attitudes, however, academic failure is seen to lead the reasons followed by the remaining reasons mentioned. This implies that parents, family members, community members, government of the day and all stakeholders have lots of work to do on our female polytechnic students to minimize and if possible put a stop to suicide attempts and actions.
Factors associated with committing suicide among female polytechnic students, the figure above showed that poverty has 192 (54.8%) and 108 (30.8%) respondents in agreement with suicide attempt. This strictly followed by drug misuse which has 155 (44.3%) through strongly agreed and agreed respectively to drug misuse. Government uncared attitudes to Nigerian youth was strongly agreed and agreed to by 121 (34.5%) and 115 (32.8%) respondents respectively. However family antecedents of suicide attempt was strongly agreed and agreed to by 72 (20.6%) and 78 (22.3%) while 127 (36.3%) and 73 (20.8%) vehemently disagreed with family antecedents as an associated factor to committing suicide. Also 81 (23.1%) and 95 (27.1%) respondents confirmed low self esteem as a factor to committing suicide. Mental disorder has 65 (18.6%) and 78 (22.3%) respondents.

The data interpretation above indicated that poverty, misuse of drugs, government uncared attitudes to Nigerian youth are the major and prominent factors associated to committing suicide. But, with little respondents agreeing to low self esteem, family antecedents on suicide and mental disorder were not given priority in the responses given.

Common methods used for committing suicide.

<table>
<thead>
<tr>
<th>S/N</th>
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<th>SA</th>
<th>A</th>
<th>SD</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sniper/Rat Killer</td>
<td>245</td>
<td>57</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>2</td>
<td>Hanging oneself</td>
<td>40</td>
<td>33</td>
<td>177</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Using Dangerous weapons</td>
<td>97</td>
<td>81</td>
<td>89</td>
<td>83</td>
</tr>
<tr>
<td>4</td>
<td>Jumping to oceans</td>
<td>23</td>
<td>27</td>
<td>156</td>
<td>144</td>
</tr>
</tbody>
</table>

Fig.5 sought to know which are the most common methods used by the respondents to commit suicide. The table above showed that, 302 respondents (86.3%) out of 100% agreed to consumption of sniper/rat killer as a very common method of suicide action. Close to this is the use of dangerous weapons which has 178 respondents of 50.8% and confirmed jumping into the sea/oceans is not very common to the respondents under study because 300 (85.7%) respondents strongly disagreed and disagreed respectively to jumping into the sea.

It is therefore proved beyond doubt that the common methods used by female polytechnic students to committing suicide are; taking snipers/rat killer and using dangerous weapons are the leading methods for suicide attempts and actions. Which of cause need to be looked into with all actions and dedications from all angles.

Who is responsible for female youth suicidal attempts?

It was found out that 319 respondents of (91.1%) confirmed that parents are responsible more for female polytechnic students’ suicide attempts and actions, this was closely followed by social media that has 159 (45.4%) and 97 (27.7%) who strongly agreed and agreed respectively while 318 (8.8%) and 63 (18%) respondents disagreed with social media as the factor responsible for female polytechnic students to attempt or commit suicide.

Environmental factors has in affirmation 210 respondents of 60% while Government is also to be blamed for female students committing suicide, this is affirmed when 108 (30.8%) and 158 (45.1%) agreed to the point.
Invariably, parents (especially mothers) have the largest respondents who apportioned blames to them for their children suicide attempts and actions. During a personal interview with some of the respondents, it was confirmed that mothers on many occasion are not concerned with their children welfare, especially girl-child. These students are too free and can engage in any act once they are not seriously catered for and monitored. Again a greater percentage of the respondents said many mothers want to force them into unripe marriages for the love of money, while some gave unfriendly attitudes coupled with not having a listening ears for their children to express themselves in whatever challenges they might be facing has been subjecting many female students to result into attempting and committing suicide, because they do not have confidence in their mothers who suppose to be their best and close friends.

Respondents were asked to suggest ways to prevent female/youth suicide actions, the under listed are some of the suggestion gave;

1. Parent cordial and friendly relationship with their children especially female child
2. Government should engage provision of intermediate and important needs for Nigerian youth
3. Intermittent moral education seminars from the religious organizations
4. Female youth orient age should change on drug abuse
5. Learn how to be independent rather than being dependent on people
6. Female youth should learn to be contented on what they and their parent can afford.

Parent cordial and friendly relationship with their children and wards especially female child should be put in place (315 [90%]) while 265 respondents of 75.7% said government should provide immediate and essential needs like work, health, education free for Nigerian Youth both male female

179 (51.1%) respondents suggested that there should be intermittent moral education seminars and training from religious organizations to change youth orientation or suicide attempt and drug abuse.

Also, 201 respondents of 57.4% suggested that Nigerian female students/youth should always be engaged on positive ventures so that they can be dependent and contented with what their parents can afford to give them. This will save them from engaging in unholy activities that will put families and the nation into troubles

5. DISCUSSIONS ON FINDINGS

This research work found out that majority of the respondents confirmed various sources of getting the idea to commit suicide from. This ranges from watching movies, televisions to social media, peer pressure and finally to friends. Hence, there is need to monitor and educate our students on use of television and movies, since the ideal could be gotten from anywhere. On the ages that are more likely to commit suicide, it was deduced that from the respondents responses that 26-30 and 31-35 years of age prone to suicide attempt. It is therefore important to monitor all ages closely to detect any unusual behavior as early as possible

Reasons for committing or attempting suicide by female adolescent youth were given as academics failure, parental unhealthy relationship, this is followed by various types of disappointment and hopelessness, and all the options have larger percentages. This in essence depicts that all the above listed options are the reasons for female students attempt to commit suicide. It was deduced that various factors are associated with suicide attempts and actions. Some of which are: poverty, drug abuse, government uncared attitudes to the youth, low self esteem antecedents to suicide attempt and mental disorder. This implies that all the above mentioned factors are associated with suicide attempts and actions in our female students.

The following methods were given by the respondents as the common means of committing or attempting suicide; drinking rat killer (Sniper), taking advantages of availability of dangerous weapons (like knife, gun, injection), hanging oneself and jumping to river/ocean. From the listed methods, it was found out that poison like rat killer has over 300 respondents. This is enough to say that the quick and fast way to commit suicide nowadays is using the rat killer called SNIPER, however, all these methods can prevented by the concerned stakeholder to allow for peaceful co-existence in the nation.

On who is responsible for female youth suicidal attempts 91.1% respondents believed that parents especially mothers are responsible. On further interview, majority of these respondents said their parent’s non-challant and uncaring attitudes towards their well being is a serious issue that bothered many of them and has done a lot of havoc to the girl-child. Also 73.1% and 60% agreed that social factor coupled with environmental challenges also contributed to female youth suicidal attempts. While 75.9% respondents confirmed that Government at all
levels are responsible for suicidal attempts of female youth. The reason given behind this is that the government has failed to cater for the essential needs of Nigerian youth which has made them to result into attempting and committing suicide.

Further interrogation from the respondents revealed that hopelessness is also a hiding factor for committing suicide. In a situation whereby hope is not coming from any angle for a female students when in dilemma, the child could result into attempting or committing suicide. Loneliness and rejection were also given as causes of suicidal attempts. It was also deduced from interview that, the level of insecurity both on human being and properties; like kidnapping, raping, ritualism attempts, robbery and the likes could make female /youth to attempt or commit suicide.

6. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

6.1 Summary of Findings and Conclusion

This study revealed that various sources have been found useful to committing and attempting suicide among which are: movies, social media, peer pressure, television, parents/guidance and friends. It therefore implies that finding solution to this menace will have to be addressed through these sources.

It was again found out that the age groups that are vulnerable to attempt or committing suicide among our female adolescent youth are between the ages of 21-35 years. Invariably, female youth both at school level and young married female youth is found out to be attempting and committing suicide depending on the factor that could be responsible

Various reasons were also given by the respondents for attempting and committing suicide procurement among the reasons are; parental attitudes (especially mothers) towards the girl-child, academic failure, hopelessness (of various levels or degree), disappointments and abandonment or rejection. It could be inferred that a lot of work needs to be done from parents (especially mothers) to get our female child closer and be confident in us. Mothers are suppose to be best friends and confident to our children (especially female youth) parents (mothers especially) need to change our orientation towards our children, no matter what happens , we must still love and care for them and encourage them not to lose hope because sky is not ever their limits.

This and the remaining reasons can still be worked upon

Poverty, drug abuse, government uncared attitudes, low self esteem, family history on suicide, insecurity and mental disorder have been found out to be some out of many factors associated with attempt and committing suicide among adolescent female youth nowadays. This shoes that if the above listed factors can be reduced, from all the stakeholders, suicide attempt will be reduced in our country only on girl child or female adolescent youth but among all classes of Nigeria citizen

On methods of committing suicide, it was found out that rat killer (sniper) has the highest respondents, hanging oneself, jumping to rivers/oceans, using dangerous weapons like knives, gun, infectious and others are the most common methods/means of committing suicide. Invariably, there is need for urgent measure to be taken covering the issue of this particular rat killer (sniper) and similar drugs.

It was found out that parent (especially mothers) environmental influence, social factors, government at all levels of religious organizations is all responsible for suicide attempt or committing same. This therefore implies that to put a stop to attempting or committing suicide. It must be with the collective responsibilities of all and sundry. Since in one way or the other, we have all been responsibilities, we must again work together to get it out of our nation.

Having highlighted and discussed the findings, it will not be out of place to suggest ways to prevent suicide attempt among our female adolescent youth, some of which are listed below;

i) Parental cordial and friendly relationship on children or wards especially female child, so as to know their needs and challenges

ii) Government at all levels should engage and provide immediate and essential needs for Nigerian youth, most especially, females
iii) There should be constant moral education seminars and discussions from the religious leaders and the concerned arms of the government, like Ministry of Women Affairs, Ministry of Youth and Development.

iv) Youth orientation to drugs and other dangerous weapons should be changed while they should be encouraged to engage in more meaningful things.

v) Female adolescent youth should be encouraged to be independent, contented, focused and reliable.

vi) Above all, they should believe and put their hope in God Almighty.

6.2 Recommendations

The future of any nation will largely depend on how the youth of such nation is fairing (especially female youth). Our youth remains our future; it now depends on how we want the future of our nation to be which will determine how seriously the stakeholders are ready to take the bull by the horn in addressing and solving issues and challenges that might hurt our female students.

If training a girl child amounts to training a nation, it means the future of this nation lies more on female youths of today. Therefore, parents, government, institutions, religious leaders, law makers/policy makers are to work with all sincerity to save our female youth so that our nation could be in harmony. The under listed are the considered to look into;

Parents (especially mothers) should see themselves as friends to their female children rather than becoming dictators who will always want to enforce things on them, they should allow them to say their mind out without fear, this will let them know where and how to come in to proffer solution to their minor or serious challenges without being hurt.

ii. Governments as a matter of urgency, ban the importation of sniper and other cough syrup that has become instrument of suicide in the country. The perpetrators of the rat killer should also be brought to book.

iii. Provision of social amenities, to all and sundry is the duty of the government of the nation, thus if done could go a long way to reduce the rate of suicide by Nigerian youth.

iv. Suicide prevention programmes should be done by all the stakeholders with female specific strategies. It should also be made on public and social objective rather than a traditional exercise in mental sector, if suicidal behavior in women is to be reduced. In corroboration to the above

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SMEs AND ITS CHALLENGES IN NIGERIA
(A STUDY OF LAGOS STATE)

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ABSTRACT

Small and medium enterprises (SMEs) are the driving force for economic growth, job creation and poverty reduction in developing countries. Cognizant of this fact, Nigeria is one of the countries which have taken measures to enhance the operation of SMEs. However, these enterprises have been experiencing various challenges that affect their operations negatively. The study examines the challenges of small and medium enterprises in Lagos, Nigeria. A sample size of one hundred and twenty (120) respondents were used out of entire population of five hundred and thirty representing managers of small and medium enterprises in Lagos State. Data were analyzed using statistical package for social sciences (SPSS) version 20. Both descriptive statistics (frequencies and percentages) and inferential statistics (simple and multiple linear regression techniques) were used in testing the hypotheses. Results revealed that small and medium enterprises in Lagos State exist in an environment characterized by both internal and external challenges which have a negative impact on their survivals. Conclusively, the study calls for financial regulatory system to extend credit facilities with minimal interest rate and exciting packages to small and medium enterprises while various tiers of government should formulate and implement policies that will be more favourable for their survivals.

Keywords: SMEs, business, challenges, economic, Nigeria

1. INTRODUCTION

A nation's ability to generate a steady stream of business opportunities can only be secure when its people take to entrepreneurial activities. Good Entrepreneurs can create a strong economy. They are an important facet of industrial growth and development of a nation. Small and Medium sized Enterprises (SMEs) are the backbone of virtually all economies of the world because of their role in employment creation and provision of personalized services (Wattanapruttipaisan, 2013). SMEs have strong influence on the sustainable development process of less developed as much as developed countries because they foster economic growth and alleviate poverty. Udechukwu (2003), asserts that the development of SMEs is an essential element in the growth strategy of most economies and holds particular significance for developing countries like Nigeria.

Small scale enterprises sector has been recognized as an integral component of economic development and a crucial element in the effort to lift countries out of poverty (Olabsi, Olagbemi & Atere 2013). Arinze, Uche & Ebele (2014), posited that the reason why government attention has always been on the small scale enterprises is that the total aggregate of small scale enterprises has the potential for accelerating the pace of economic development of the country and has successfully played positive role in the economic life of Nigerian in the rural areas. According to Jegede (1990), small scale enterprise in Nigeria seems too stagnant, less adventurous than developed countries. Meanwhile in economically developed countries small scale business are better organized and coordinated than in the developing countries because the governments appreciate their significance to the national economy. According to Dugguh (2015), small businesses in Nigeria are faced with numerous challenges that resulted in their failure. Dugguh (2013), further stated small businesses must develop strategies that will mitigate challenges and sustain operations. However, it appears that considering the enormous potentials of the SMEs sector, and despite the acknowledgement of its immense contribution to sustainable economic development, its performance still falls below expectation in many developing countries. This is because the sector in these developing countries has been bedeviled by several factors such as management inability militating against its performance, and leading to an increase in the rate of SMEs failure. These factors include the unfavorable and very harsh economic conditions resulting from unstable government policies; gross under capitalization, strained by the difficulty in accessing credits from banks and other financial institutions; inadequacies resulting from the highly dilapidated state of Infrastructure facilities; astronomically high operating costs; lack of transparency and corruption; and the lack of interest and lasting support for the SMEs sector by government authorities. The very ownership of a business tends to create elitist attitudes and
self-orientation. It imposes a monocular vision which limits the company's capacity to respond positively and aggressively to business opportunities and changing business conditions.

**Statement of the Problem**

SMEs relies on bank credit for its survival which are also sharpen with huge interest rate, despite this huge interest rate the multiple taxation system has been a great threat to the capital structure of SME’s in Nigeria. The problem of high tax rates i.e. lack of proper enlightenment about tax related issues, poor managerial skills and political instability in Nigeria which include government policy on export and import duties as well as fluctuation of exchange rate which kills the ambition of SMEs to source its materials and export its product to foreign customers.

**Objective of the Study**

In almost all economies, high performances of SMEs are vital for sustained growth. Therefore the reason for poor performance of small business enterprises is worth investigating. Thus, this study intends to investigate the challenges inhibiting SMEs ventures and its competence in Nigeria with special attention to Lagos State. Other specific objectives include:

i. To examine the effect of financial challenges on the survival of SMEs in Nigeria

ii. To examine the effect of inconsistence of government policies on the survival of SMEs in Nigeria.

**Research Hypotheses**

**Hypothesis One**

$H_0$: Financial challenge has no significant effect on the survival of SMEs in Nigeria.

**Hypothesis Two**

$H_0$: Inconsistence in government policy has no significant effect on the survival SMEs in Nigeria.

2. **LITERATURE REVIEW**

**Small and Medium Scale**

SMEs in Nigeria are seen as the backbone of the economy and a key source of economic growth, dynamism and flexibility. A study done by the Federal Office of Statistics shows that 97% of all businesses in Nigeria employs less than 100 employees, implying that 97% of all businesses in Nigeria are “small businesses”. The SME sector provides, on average, 50% of Nigeria’s employment and 50% of its industrial output (General Statistics Office, 2007). Indeed, there appears to be an agreement that the development of SMEs in Nigeria is a step towards building a vibrant and diversified economy (Mahmoud, 2005). The definition of SMEs depends mainly on the level of development of the country. In most developed market economies like the United States of America (USA), U.K. and Canada the definition criterion adopted a mixture of annual turnover and employment levels. In Nigeria, the Small and Medium Industries Enterprises Investment Scheme (SMIEIS) defines SME as any enterprise with a maximum asset base of N200 million excluding land and working capital and with a number of staff employed not less than 10 or more than 300. Nwokoye (1988), defines Small and Medium-Scale business as “any enterprise employing between five and one hundred workers with an annual turnover of about four hundred thousand Naira (N400, 000). The Federal Ministry of Commerce and Industry defines SMEs as firms with a total investment (excluding cost of land but including capital) of up to N750, 000, and paid employment of up to fifty (50) persons. SMEs exist in the form of sole proprietorship and partnership, though some could be registered as limited liability companies and characterized by: simple management structure, informal employer/employee relationship, labour intensive operation, simple technology, fusion of ownership and management and limited access to capital. The seven major sources of funding available to SMEs in Nigeria include: personal resources, family and friends, partners or business associates, informal financial markets, banks, specialized funding facilities e.g. NERFUND and specialized financial institutions e.g. NBCI, BOI, NIDB etc. (Owualah, 1999). Their role in economic development includes: technological/industrial development, employment generation, technology acquisition, capacity building, promotion of economic growth, increased standard of living, industrial dispersal or spread, servicing of large-scale industries, export promotion, structural transformation of rural areas, flexibility and low take-off requirements (Odubanjo, 2000).

**SMEs Performance Contribution to Nigeria’s Development**

A healthy and robust SME sub-sector is a sine qua non for inclusive and socially sustainable development (Ogboru, 2005) and one of the significant characteristics of a flourishing and growing economy is a booming and blooming small and medium enterprises SME sector (Fida, 2008).

The performance and role of SMEs going forward are bound to be even greater and more pervasive with a demonstrable impact on the emerging world trading order. SME is the driving force and establish an important
mainstay of the nation’s economic system. The evolution of this sector leads to poverty relief, employment creation and multiplication of potential entrepreneurs. It offers linkage development of large industries. SME has remained a harbinger of change and a pivot of economic catalysts in industrialized states as they are in the developing world. Oluba (2009) observed that the importance of SMEs varies with sectors and with the developmental stage of a country. He opined that developing characteristics such as the degree of capital allocation and requirements, management size and arrangement as well as limited market access which makes SMEs less amenable to the unsatisfying effects of growth schemes that concentrate on large, capital intensive and high import dependent industrial plants as well as failed public enterprises.

Employment
Employment generation globally is one of the most significant reasons for encouraging the promotion and development of SMEs. SMEs account for well over half of the total shares of employment, sales and value added (Davis, Haltiwagner & Schuh, 1993). From the viewpoint of economic development, small businesses create almost half of new jobs in the economy, and it is assumed that they are good jobs (Davis, Haltiwagner, Schuh, 1993; Edmiston, 2007). SMEs make the most viable and authentic vehicle for self-sustaining industrial development, as they have the capability to produce an indigenous enterprise culture to a greater extent than any other strategy. SMEs represent the sub sector of special focus in any meaningful economic restructuring plan that targets employment generation, poverty relief, food protection, rapid industrialization and reversing rural urban migration in essence “small is profitable in Africa”.

Scholars are of the view that enhancing the performance of small business and promoting the development of entrepreneurship would be a good strategy to contribute and promote economic development (Snodgrass & Biggs, 1996).

Poverty Alleviation
The development of SMEs is seen as the means to accelerating the achievement of wider socioeconomic goals, including poverty alleviation (Cook & Nixson, 2000). Reduction of poverty through the promotion of SMEs plays a substantial role in the development process of any country. SME promotion may be one of the most effective poverty alleviation instruments. An increase in the living standards of the people is the main concern of any development process (Kongolo, 2010).

Transformation of Indigenous Technology
All economies have transited from household artisan industries over time to the modern industrial set-up which has witnessed phenomenal upgrading of skills, machinery and equipment, and management practices (Kongolo, 2010). Historical evidence indicates that most of today’s giant corporations began as very small firms. These include Guinness of Dublin and Philips international of the Netherlands; as good as Sonny and Honda of Japan. Developing countries can take from the experience of these giants and create conducive environment that will enable small and medium enterprises to adapt imported technologies, modernize their process and grow to become large corporation.

Policy Measures That Will Encourage Growth of SMEs
Although some policy measures are geared towards SME growth in Nigeria, the support needs to be increased, standardized and systematic. Iwuji (n.d) believes that it is the role of the government to provide the enabling environment and social services that support businesses and entrepreneurs, and thus enhancing the investment climate in Nigeria for increased economic growth and subsequent tax contribution from all citizens, since a good number of SMEs operate in the informal economy due to the fact that they deem the tax environment within which they operate as unfavorable. These SMEs constitute untapped revenue potential and an uneven playing field in many countries (International Tax Dialogue, 2007) as such they need to be captured by the tax net.

The legislation is a necessary regulator for protection of the business environment and security of the economic agents, for establishment of the necessary social security regulations but at the same time it hampers the business with additional expenditures and administrative obstacles, which place in different positions the SME. The big companies have more choices possibilities. They can either share part of the staff or hire people to deal only with studying the legal requirements and complying with the new regulations, or contract some personal service firm (like E&Y, Deloitte and Touché, Price Waterhouse etc.) to deal with their tax compliance, planning etc. For SME this is a great expense out of their abilities. (Smatrakalev, 2006). Shahrodi, (2010) believes that for a tax system to be efficient, the tax policy needs to be designed such that the tax rates are appropriate and rational, the exemptions are lower in amount, the tax collection organization are more efficient, the tax burden of the indigent people should be lighter and the fight against corruption and tax evasion should be much more intense.
Tax policies can be designed in such a way that they do not only directly affect SMEs but also indirectly push for their growth by example the practice in China where tax policy has been designed to encourage SME financing by granting exemptions from business tax for financial corporations that provide guarantee for loans to SMEs and granting tax deductions to market entities and venture capitalists that invest in high-tech SMEs the tune of 70% of the investment value. Another way is by designing tax policies that encourage human capital training. (Yaobin, 2007).

Special tax regimes for SMEs may be appropriate policy instruments for minimizing the cost of collection. It is important to note that the awareness of the dangers of inadequate attention to the taxation of SMEs has grown. It can lead, for example, to distortions of competition as a result of uneven tax enforcement, with incentives created to limit growth and to avoid tax through artificial splitting of enterprises. Not least, voluntary compliance by larger enterprises themselves, and by wage earners, may be undermined by the (correct) perception that their smaller counterparts, or better-off neighbors, are getting away with poorer compliance. (International Tax Dialogue, 2007) Hence government intervention will help maintain balance while helping countries exploit the social benefits from greater competition and entrepreneurship. The European Charter for Small Enterprises for instance, sets the objective that “Tax systems should be adapted to reward success, encourage start-ups, favour small business expansion and job creation, and facilitate the creation and the succession in small enterprises. Member States should apply best practice to taxation and to personal performance incentives.”

Arguments are sometimes made for preferential treatment of smaller enterprises on pure policy grounds: if they have difficulty raising external finance, for example, a reduced tax rate on retained earnings, freeing more internal finance, may seem useful. The importance of this and other possible market imperfections in impeding realization of the full potential of SMEs remains unclear. The crucial points, however, are that size itself may not be closely associated with the relevant market failure (some smaller enterprises may face no financial constraints, for example), and tax interventions will often be dominated by targeted spending measures (such as development loans). Inadvertent damage to smaller enterprises from flawed tax design should be avoided, but the case for preferential treatment is far from clear. (International Tax Dialogue, 2007).

Furthermore, policy incentives such as tax rebate for SMEs that put effort on local sourcing of raw materials, serious in adding value to commodities for exports and other business ethics, should be employed by government. Similarly, government could increase funding for the development of the sub-sector through direct budgetary allocations and enhance private sector investment opportunities that will focus on specific areas of capacity enhancement.

The use of tax incentives are encouraged because they are “fiscal measures that are used to attract local or foreign investment capital to certain economic activities or particular areas in a country (SADC Memorandum of Understanding on taxation, 2002). They are deliberate reductions in tax liability to compensate for deficiencies in the investment environment and entry of players into the sector (Iwuji, n.d), thus attracting investment and creating a prospective source of tax revenue, encourage savings and stimulate investment that leads to a better economy (Bolnick, 2004).

Tax law should be simplified continuously, mainly for three reasons, namely to lower both compliance costs and administrative costs, to reduce uncertainty faced by taxpayers; and to improve the levels of voluntary compliance (Kasipillai, 2005). Pro-business (and Pro-SME) Tax regimes and enforcement should be simple, consistent and predictable. In Uzbekistan for instance, one of the steps that promoted the development small businesses was the adoption of a simplified system of taxation for micro-firms and small enterprises in 1998. Tadjibaeva & Komilova (2009), reported that the simplified order of taxation proposed payment of a single tax in lieu of all federal and local taxes and payments (except trade, licensing and registration duties). The rates of single tax vary according to the industry in which the SME operates. The shift to a simplified system of taxation substantially reduced tax burden of small businesses and tax administration procedures became less cumbersome and costly, mainly in bookkeeping and reporting. SMEs were eligible to use either simplified or general accounting procedures based on their preference. Encouraging SMEs to maintain good accounts is also a way to help the SMEs because the associated good record keeping for tax purposes is also beneficial to the businesses’ financial health. Others are continued reduction of tax rates for SMEs, improving the technological development of preferential tax policies which will invariably reduce the compliance costs of SMEs and strengthening the services of tax administration towards SMEs.
Theoretical Review

Theories of Business Growth

Various authors have postulated theories pertaining to business growth. The oldest and most common theory according to Elhiraika & Nkurunziza (2006) is Gibrat’s ‘Law of Proportionate Effect—LPE’, (1931). Here, Gibrat stipulates that the rate of growth of a firm is independent of its initial size. By implication, it would mean that large firms are preferable in the context of private sector development given that they create more employment than small firms. Conversely, Jovanovic (1982) states in his ‘Learning model’ that younger firms learn over time, which helps them improve their performance as they accumulate market knowledge. According to this model, young firms grow faster than old ones. Moreover, given that younger firms are usually smaller than older businesses for the reasons discussed above, Jovanovic deduces that small firms grow faster than large ones. This is a convergence process where small firms will eventually become as large as any other large firm in the same sector over time.

Churchill & Lewis (1983) as cited in Olawale & Garwe (2010) on the other hand claim that as a new small firm starts and develops, it moves through some growth stages, each with its own distinctive characteristics. These authors also identified the stages of growth as; existence, survival, success, take-off and resource maturity. In each stage of development as different set of factors is critical to the firm's survival and success. The Churchill Lewis model gives an insight into the dynamics of SME growth, including the distinguishing characteristics, problems and requirements of growing SMEs and explains business growth processes amongst SMEs. The precise moment in time in which a start-up venture becomes a new business has not yet been theoretically determined. However, the idea of business survival could be equated with a firm that has fully completed the transaction to stage-two organization in the five stages of small business growth.

Classical Theory of Unemployment

The classical theory believes that every economy has full employment and any deviation from this condition automatically adjusts to restore the economy back to full employment (Jhingan, 2007). According to Say (1824) there will never be over production or general unemployment as supply creates its own demand. The theory believed that expansionary monetary policy may result to unemployment due to downward rigidity of money wages. However, increase in money supply will raise the liquidity which will invariably lead to increase in aggregate demand. Rise in aggregate demand will in turn raise the price level and lowers the real wage. The rise in price level and falling real wage enhance the profit of the SMEs. These serve an incentive for SMEs to employ more workers in order to expand output and reduce unemployment. The theory posited that as the employment generation continue to rise, the total output will as well continue to rise until the economy attain full employment. At full employment, the total output of the economy will be stable which is the function of capital stock, labour and, technology. This shows that the rate of workforce in the economy determine her level of productivity. The classical theory assumes that employment growth rate is exogenous to the output growth rate. However, Keynes (1936) disagrees with the classical in that no economy will ever achieve full employment. He went further to say that supply always exceeds its demand. The theory pointed out that supply of labour (employment) drives the growth process. This implies that at full employment in the economy, there will be many investors in SMEs sector which will invariably increase credit demand of the sector.

Empirical Review

Ezeaku, Anidiobu & Okolie (2017), assessed the effect of SMEs financing on manufacturing sector growth in Nigeria using annualized data from 1981 to 2014. A co-integrating relationship was determined using the Engel and Granger residual based approach which showed evidence of a long-run relationship between SMEs credit and manufacturing output growth in Nigeria. The results of the error correction model showed that SMEs financing had exerted positive influence on the manufacturing sector growth. The finding indicated that when credits to the SMEs increased by 1%, manufacturing output rose by 14.5%. The results also revealed that interest rate and inflation rate had negative effect on manufacturing sector growth. A unit change in interest rate led to 15.7% fall in output growth of the manufacturing sector. We conclude that while SMEs is an important sector that can drive the Nigerian economy, rising interest rate stifles their growth and overall economic impact. This sector needs nurturing hence the government and monetary authorities should make policies and create enabling environment for SMEs to thrive. Access to fund should also be made easy and at low interest rate.

Okey (2016), examined the role played by commercial banks’ credit in facilitating the growth of SMEs in Nigeria. It adopted co-integration and error correction mechanisms in carrying out this empirical examination. The findings revealed that Commercial Banks’ credit has not contributed significantly to the growth of Small and Medium Scale Enterprises in Nigeria. To support the growth of SMEs by Commercial Banks, so that they can be properly positioned to play a catalytic role in rapid industrial take off and development in Nigeria, the paper recommended as follows: SMEs should be made to have easy access to credits by commercial banks, to
achieve this, the monetary authority should ensure that the lending rate at which commercial banks lend to the SMEs is reduced to the barest minimum; devaluation of the national currency – the naira, should not be encouraged as devaluation makes imported raw materials and capital goods used by the SMEs very expensive and hence impedes their production rather, local sourcing of raw materials should be encouraged to reduce the pressure on exchange rate; and finally, more Commercial Bank branches should be established in Nigeria, especially in the rural areas to create opportunity for SMEs operating in such areas to have access to credits and finance their operations.

3. METHODOLOGY
The paper made use of a survey design. The data required for this study was extracted from a primary source through the use of a structured questionnaire and the data was collected through surveying the one hundred and twenty respondents (120) which was the sample of the entire population of five hundred and thirty (530) representing small and medium enterprises managers in some environs in Lagos State. However, since the population of the study (530) is considered large, the study adopted a sampling method using Yaro Yamine sampling formulae.

4. DATA PRESENTATION AND ANALYSIS
Both descriptive and inferential statistics methods were used. The descriptive statistics included frequencies and simple percentages while the inferential statistics consisted of both simple and multiple linear regression technique in testing the hypotheses, using SPSS version 20. Both descriptive and inferential statistics methods were used.

Testing Of Hypotheses

Hypothesis One
H0: Financial challenge has no significant effect on the survival of SMEs ventures in Nigeria.
Decision Rule: Reject the null hypothesis if the significant value (p-value) is less than α = 0.05 otherwise we do not reject the null hypothesis.

Table 1: Model Fitting Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Fitting Criteria</th>
<th>Likelihood Ratio Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept Only</td>
<td>72.647</td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td>37.391</td>
<td>35.256</td>
</tr>
</tbody>
</table>

Source: Field Survey, July 2019

From the above table, the “Final” row present information on whether all the coefficients of the model are zero (i.e., whether any of the coefficients are statistically significant). And from the table, one can see that the significant value p = 0.004 less than α = 0.05, we reject the null hypothesis and conclude that financial challenge has a significant effect on the survival of SMEs ventures in Nigeria.

Table 2: Likelihood Ratio Tests

<table>
<thead>
<tr>
<th>Effect</th>
<th>Model Fitting Criteria</th>
<th>Likelihood Ratio Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>37.391</td>
<td>.000</td>
</tr>
<tr>
<td>Q6</td>
<td>50.767</td>
<td>13.376</td>
</tr>
<tr>
<td>Q9</td>
<td>58.780</td>
<td>21.388</td>
</tr>
</tbody>
</table>

Source: Field Survey, July 2019
The table above shows that the independent variables are statistically significant. It is clear that all the variables tested were statistically significant at $p = 0.020, 0.000$ (the "Sig." column). This result shows a correlation and suggested that financial challenge has a significant effect on the survival of SMEs ventures in Nigeria.

**Hypothesis Two**

$H_0$: Inconsistence in government policies has no significant effect on the survival of SMEs ventures in Nigeria

**Decision rule:** Reject the null hypothesis if the significant value (p-value) is less than $\alpha = 0.05$ otherwise we do not reject the null hypothesis.

<table>
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<tr>
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<tr>
<td>Intercept Only</td>
<td>73.225</td>
<td>44.337</td>
</tr>
<tr>
<td>Final</td>
<td>28.888</td>
<td>12</td>
</tr>
</tbody>
</table>

**Source:** Field Survey, July 2019

The table above shows that the independent variables are statistically significant. It is clear that all the variables tested were statistically significant at $p = 0.000, 0.000$ (the "Sig." column). This result shows a correlation and suggest that inconsistence in government policies has a significant effect on the survival of SMEs ventures in Nigeria.

**Discussion of Results**

From the findings above, analysis of the result shows that financial challenges pose a great threat to the survival of small scale business in Nigeria, financial challenges limit operational scope of small scale business in Nigeria.

The results also show that political instability is associated with political environment which are characterized with government multiple taxation policy and government importation and exportation policy which poses a great threat to the survival small scale businesses in Nigeria.

### 5. CONCLUSION AND RECOMMENDATION

#### 5.1 Conclusion

This research work is to investigate the challenges inhibiting SMEs ventures and its competences. It was concluded that financial challenges is the major threat to the survival of small scale business in Nigeria, financial challenges set a great limitation to the business operation of SMEs in Nigeria.

Finally, inconsistence in government policies (political instability) has a great influence on the survival of business organization as well as SMEs. Political instability includes government multiple taxation system, fluctuation of macro-economic variables which poses a great threat to the survival small scale businesses in Nigeria.

#### 5.2 Recommendations

Sequel to the findings from the study, the researcher makes the following recommendations:

i. Government should endeavor that there are available and sufficient credit allocated to the small scale business in Nigeria with reasonable and affordable lending rates. This will enable the entrepreneurs in Nigeria to operate on their production possibility curve, which is full capacity. In the long run it will lead to development of the Nigerian economy, through employment generation, innovation, competition, economic dynamism and promotion of indigenous technology.

ii. Government through the Central Bank of Nigeria should pursue policies that lower lending rate on one hand and reduce inflation rate on the one hand as well as increase money supply. This will help increase the volume of loans and advances to manufacturing sector investors in order to increase the output of the small and medium scale enterprises which is capable of stimulating economic growth.
The commercial banks (deposit money banks) should not only be interested in its profit maximization, but should also be occupied with the various needs of SMEs in order to protect her nation against risks and help to encourage economic growth and development in the long run.

Proper public enlightenments should be carried out to sensitize the populace on government efforts in order to obtain the needed co-operation and support for the implementation of the policy to enhance overall development in the state.

REFERENCES


1st National Conference of WITED, Ilaro Chapter


A COMPARATIVE ANALYSIS OF THE ACADEMIC PERFORMANCE OF MALE AND FEMALE STUDENTS IN THE POLYTECHNIC

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ABSTRACT

The study carried out a comparative analysis of the academic performance of male and female student in the polytechnic using Federal polytechnic Ilaro as a case study. Particularly Estate management and valuation students and Quantity Surveying students form the basis of this study. The comparism was done using the mean cumulative grade point average of final year student result for a period of four consecutive academic sessions. It was discovered that male student performed better in Estate management and valuation department whereas female student that studied Quantity surveying performed better than their male counterpart. A further analysis was carried out to determine factors influencing academic performance of polytechnic students. A structured questionnaire in Likert scale was administered on final year students of the two departments under review. Eighty (83) questionnaires was administered on the students to harvest their perspective. The responses were further collated, analyzed with SPSS software, processed with Mean method and presented in tables. The study revealed that complex course content, mode of subject delivery and financial problems top the list amongst 18 variables examined. Suggestions were proffered on what could be done to improve academic performance of all gender components.

KEYWORDS: Academic performance, Gender, Polytechnic, Student.

1. INTRODUCTION

Education is a process designed to inculcate the knowledge, skills and attitudes necessary to enable individuals to cope effectively with their environment (Umar, Yagana wali, Ali & Mohammed, 2015), it ensures the acquisition of knowledge and skills that enable individuals to increase their productivity and quality of life (Farooq, Chaudhry, Shafiq & Berhanu, 2011).

Human activities evolve around education especially in this era of technology and globalization, people are now more aware of the advantages and importance of education, this is evident in the increasing number of students seeking admission into tertiary institutions. Gender plays a crucial role in the numbers of students who choose and are admitted into some course of study especially science based department. It is believed that male students perform well academically in science oriented courses than female students (Adigun, Onihuwa, Irunokhai, Sada & Adesina, 2015).

There are different factors affecting the academic performance of students, these ranges from individual and household characteristics such as motivation from the family and environment provided to student, student’s ability and the quality of education obtained (Faisal, Shinwari , & Hussain, 2017). Johnson and Elder, (2004) identified student factors, family factors, school factors and peer factors affecting academic performance of the students. Farooq et al (2011) identified age, gender, geographical belongingness, ethnicity, marital status, socio economic status, parent’s education level, parental profession, language, income and religious affiliations as factors affecting student’s academic performance.

Voyer and voyer (2014) revealed that females performed better than their male counterparts while Awofala (2011) and Oluwalogbohunmi (2014) disclosed that male students performed better than females. It is against this background that the study set out to carry out comparative analysis of the academic performance of male and female student in the polytechnics.
2. MALE AND FEMALE STUDENT ACADEMIC PERFORMANCE

Students’ academic performance plays an important role in producing the best quality graduates who will become great leader and manpower for the country as well as for the country’s economic and social development (Humaida, 2017).

Juma and Simatwa (2014) strongly believed that gender is a major factor influencing students’ academic performance. Female students lag behind their male counterparts because of family and social cultural obligations such as domestic chores which place undue pressure on females, and, consequently, on their academic resilience and achievement.

Another major factor considered by scholars which affects academic performance is the learning environment. According to Faisal et al (2017) learning cannot occur without physical and psychosocial safety and security in the classroom, in the school and schoolyard, and on the way to and from school as this requires that safe, secure, private and sanitary facilities are available and accessible, with separate provision for girls and boys. It also requires policies and procedures to protect girls and boys from intimidation, harassment, sexual abuse and other forms of physical or mental violence.

Amusan, Tunji-Olayeni, and Adeedeji (2016) laid emphasis on learning environment as an important aspect of knowledge acquisition. Learning environment was categorized into three: the natural learning environment, virtual learning environment and E-learning environment. Beyond the social structure learning environment have effect on pattern and extent of knowledge impartation.

3. RESEARCH METHODOLOGY

The study adopted a survey research design which involves analysis of both secondary and primary data. Secondary data analysis entails collection and analysis of final year results of the two departments for a period of four consecutive academic sessions.

The primary data involves the use of questionnaire to solicit information from final year students (ND II and HND II) of Estate Management and Valuation Department and Quantity Surveying Department on factors influencing students’ academic performance in the polytechnic. A purposive sampling technique is suitable in this regard. This research uses the Krejcie and Morgan (1970) table of determining sample size from the population with 95% confidence level, 5% margin error and a population of 104 students, the table gave a sample size of 83 students. This is represented in Table 1.

<table>
<thead>
<tr>
<th>Department</th>
<th>Population</th>
<th>Sample</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estate Management &amp; Valuation</td>
<td>36</td>
<td>29</td>
<td>34.6</td>
</tr>
<tr>
<td>Quantity Surveying</td>
<td>68</td>
<td>54</td>
<td>65.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>104</strong></td>
<td><strong>83</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Authors’ field survey, 2019.

The analysis is confined to simple percentage, frequency distribution and mean.

4. RESULTS AND DISCUSSION


This analysis was carried out using the mean Cumulative Grade Point Averages (C.G.P.A) of the Final year (ND II and HND II) students in Estate Management and Valuation Department as well as Quantity Surveying Department between 2014/2015 and 2017/2018 academic session. The result of this analysis is presented in figure 1.
Data from Estate Management and Valuation Department shows both male and female as having about the same mean C.G.P.A at Ordinary National Diploma level. However, at Higher National Diploma level, the result shows that the male students perform better than their female counter part over the whole period.

For Quantity Surveying department, at Ordinary National Diploma Level, the result shows that female students performed better than male students for all the period assessed. At Higher National Diploma level, the female student performed well above male student in 2014/2015 and 2017/2018 academic sessions while male students took upper hand in 2015/2026 and 2016/2017 academic sessions.

**4.2.1. Factors influencing students’ academic performance**

Structured questionnaires were distributed to final year students in Estate management and valuation department as well as Quantity Surveying department based on the sample size earlier determined. Their perceptions were sort on 18 variable representing factors influencing students’ academic performance in the polytechnic. A scale of 1 to 5 was adopted for questionnaire calibration, with 1 indicating strongly disagree (SD) 2 being disagree (D) 3 being neither agree nor disagree (N), 4 being agree (A) and 5 being strongly agree (SA). Their response was processed using mean. The result is as presented in table 2.

The result in Table 2 shows that complex course content with mean index value (4.10) was ranked first, followed closely by mode of subject delivery (4.08) and financial problems (4.07). However age difference (2.23), external interference (3.06) and poor learning environment (3.11) were the three least factors respectively. It is not surprising that complex course content ranked highest in this research as polytechnic students have only four years duration to study what their university counterparts will study for five years coupled with extensive practical. Likewise mode of subject delivery because of the work load on lecturers to cover the syllabus they tend to brush through the contents in order to be able to meet up. It is also a general believe that polytechnics are for the poor or middle class, that explains why financial problems is surfacing as a major factor affecting students performance.
Table 2: Factors influencing students’ academic performance

<table>
<thead>
<tr>
<th>Factors influencing academic performance</th>
<th>Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex Course Content</td>
<td>4.10</td>
<td>1</td>
</tr>
<tr>
<td>Mode of subject delivery</td>
<td>4.08</td>
<td>2</td>
</tr>
<tr>
<td>Financial Problem</td>
<td>4.07</td>
<td>3</td>
</tr>
<tr>
<td>Complex curriculum</td>
<td>3.99</td>
<td>4</td>
</tr>
<tr>
<td>Educational background</td>
<td>3.98</td>
<td>5</td>
</tr>
<tr>
<td>Lack of Basic Study Materials</td>
<td>3.93</td>
<td>6</td>
</tr>
<tr>
<td>Psychological problem</td>
<td>3.92</td>
<td>7</td>
</tr>
<tr>
<td>Family problem</td>
<td>3.77</td>
<td>8</td>
</tr>
<tr>
<td>Course dissatisfaction</td>
<td>3.71</td>
<td>9</td>
</tr>
<tr>
<td>Teachers challenge</td>
<td>3.63</td>
<td>10</td>
</tr>
<tr>
<td>Emotional disturbance</td>
<td>3.59</td>
<td>11</td>
</tr>
<tr>
<td>Intelligence Quotient</td>
<td>3.55</td>
<td>12</td>
</tr>
<tr>
<td>Attention to details</td>
<td>3.51</td>
<td>13</td>
</tr>
<tr>
<td>Emotional Maturity</td>
<td>3.48</td>
<td>14</td>
</tr>
<tr>
<td>Social Engagement</td>
<td>3.13</td>
<td>15</td>
</tr>
<tr>
<td>Poor learning Environment</td>
<td>3.11</td>
<td>16</td>
</tr>
<tr>
<td>External interference</td>
<td>3.06</td>
<td>17</td>
</tr>
<tr>
<td>Age Difference</td>
<td>2.23</td>
<td>18</td>
</tr>
</tbody>
</table>

Findings of this study is in clear disparity with findings of Amusan et.al.(2016), this shows that there is clear difference between factors influencing academic performance of polytechnic students and that of university students.

5. CONCLUSION AND RECOMMENDATION

From the result, it was discovered that male students that studied Estate management and valuation performed a little better than their female counterpart however, the opposite is the case for male student that studied Quantity surveying between the periods considered as female students performed better.

The study also revealed major factors that influence academic performance of polytechnic students as complex course content, mode of subject delivery, financial problems amongst others. In light of the discoveries of this research, the accompanying suggestions are put forward towards improved academic performance of polytechnic students.

- Demystifying complex course content/curriculum for easy understanding.
- Polytechnics lectures are admonished to ensure adequate and thorough lecture delivery.
- Trainings should be conducted for lecturers from time to time and a system of monitoring how lecturers deliver their lectures should be put in place and enforced in the polytechnics.
- Parents should endeavor to give their children adequate financial backings in order to improve their academic performance.

REFERENCES


ABSTRACT
Fashion, particularly in Nigeria, has always been more than just dressing in the outward sense; it has always carried with it a sense of all that the people stand for, their belief, their cultural heritage, their experience, in fact, their identity. The advent of western civilisation through colonialism has however affected the fashion sense of Nigerians; modern fashion is hence the outward reflection of the psychological borrowing of western ideologies which has permeated every sphere of our national dealings. This study examines modern fashion as a “sign”, a signifier of the changing post-colonial identities of Nigerian women. The primary texts under consideration is Adichie, Chimamanda Ngozi’s Americanah with keen interest in the female Nigerian characters of the text, at home and in diaspora, and how they express their changing post-colonial allegiances, through their fashion. The theories adopted for analysis are post-colonial feminism and semiotics. The research is able to affirm that fashion is vital to the discourse of identity and that it may be interpreted as a sign of underlying post-colonialism. Analysis shows that the post-colonial situation of Nigeria has occasioned the desperate need for survival among women to varying complicated degrees. Nigerian women everywhere struggle with issues of post-colonialism such as place and displacement, hybridity, diaspora, and hegemony, among others, and that these their experiences are made manifest and documented in their fashion statements. It is therefore subsumed that modern fashion is a potent tell-tale of post-colonialism.

KEYWORDS: Women, Fashion, post-colonialism, identity

1. INTRODUCTION
The question of identity is crucial, especially to any people who have ever had their identities under question resulting from cultural hybridity, diaspora, imperialism, trans-nationality, and displacement. According to Ashcroft et al (2004):

“A valid and active sense of self may have been eroded by dislocation, resulting from migration, the experience of enslavement, transportation, or voluntary removal for indentured labour. Or it may have been destroyed by cultural denigration, the conscious and unconscious oppression of the indigenous personality and culture by a supposedly superior racial or cultural model.” (9)

Thus, any situation of culture-contact, such as colonisation, is a potent causative of identity crises. The hybridity of culture resulting from colonisation has psychological implications for both the coloniser and the colonised. However, when we speak of post-colonial literature, attention is focused on the writings of the colonised people and how they reflect their colonial experiences. Hence, it is not the interest of this research to interrogate the psychological implication of colonialism on the colonised, but the material manifestation of the influence of colonisation on the colonised people by assessing their idea of fashion. The generally accepted mode of appearance of the people (which inevitably captures their state of mind) and how they employ fashion to signify their changing identity, because, as posited by Burman and Turbin, (2002) “fashion is closer to personal identity than other material objects, it reveals significant social change at several levels, and subtle links between changes in individual and historical processes, especially with regard to gender ideologies” (5)

The dynamism of identity is premised upon the fact that it is constantly changing as influenced by the changing human conditions. And individual or personal identity cannot be radically severed from social identity. The two terms are mutually inclusive as the former seems to reflect the consequences of the latter and vice versa, hence they say that ‘identity is socially constructed’. Scholars have agreed that the question of identity is answered when one answers the question: who are you? However, this question will produce different answers under different circumstances because different social contexts or situations influence a person’s opinion of himself at given points in time. What post-colonial factors influence a woman’s perception of ‘self’ How does this sense of

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‘self’ change with her changing experiences? How does her fashion statement signify this changing sense of self? These are the concerns of this paper.

1.1 BACKGROUND
This paper is interested in examining the fashion sense of the female characters of Chimamanda Ngozi Adichie’s Americanah with particular interest in the leading characters, with a view to discovering how their experiences as western-civilised women have shaped their idea of fashion and the extent to which this idea corresponds to the native sense of fashion. This research has chosen to concern itself with fashion-particularly women’s fashion, because it has been observed that little scholarly attention has been paid, so far, to modern fashion as a postcolonial phenomenon. Whereas, the study of modern fashion alone is key to understanding aspects of post-colonial influences like religion, education, trade and commerce, because fashion is their materialisation.

The interest of this paper has been drawn to Chimamanda’s Americanah for its versatility in the area of interest of this paper. In that the writer is a post-colonial Nigerian writer who has experienced western education both at home and abroad and therefore has related her experiences as a Nigerian woman in diaspora through her female characters. The story of Ifemelu fascinate us as a ‘signifier’ of the post-colonial experiences of her creator- the writers, as well as the subtle hints dropped every now and then through other female characters in the book which are relevant to the subject of this work.

1.2 THEORETICAL FRAMEWORK
The theories employed in the analysis of the selected text of this paper are Semiotics and Post-colonialism theories respectively.

Semiotics

One broad definition of semiotics is the one given by Eco that “semiotics is concerned with everything that can be taken as a sign. A sign is everything which can be taken as significantly substituting for something else” (Umberto, 1976; 7) To explicate on this Chandler” (no date; 2) says “semiotics involves the study not only of what we refer to as ‘signs’ in everyday speech, but of anything which ‘stands’ for something else…how meanings are made and how reality is represented”

Lechte (1994) like Chandler, also identifies Ferdinand De Saussure and Charles Peirce as the earliest figures associated with the theory of semiotics. And following the opinion of Chandler which contains models offered by the earliest scholars, we have limited the concern of semiotics in this paper to human semiosis only. This is because it is based in the humanities; more focused and suitable for the purpose of this paper.

According to Chandler, ‘for the philosopher Charles Peirce ‘semiotic’ was the ‘formal doctrine of signs’ which was closely related to Logic. For him, ‘a sign... is something which stands to somebody for something in some respect or capacity’ Peirce’s position is that ‘every thought is a ‘sign’ In other words, a sign is what you make of it. Pierce says that nothing is a ‘sign’ unless it is interpreted as a sign. Anything can be a sign as long as someone interprets it as ‘signifying’ something referring to or standing for something other than itself.

Saussure offered a 'dyadic' or two-part model of the sign. He defined a sign as being composed of: a 'signifier' (signifiant) - the form which the sign takes; and the 'signified' (signifié) - the concept it represents. The sign is the whole that results from the association of the signifier with the signified.

Using this theory therefore, this paper examines how fashion signifies identity and how it represents the colonial experiences of Nigerian women. It analyses modern fashion as the outward/physical manifestation of deeply rooted psychological, economic, cultural, social, and religious displacement and hybridity of the post-colonial Nigerian woman, analysing the fashion sense of Nigerian women both at home and in diaspora, as signifiers of their conformities and conflicts with the demand of their post-colonial society.

Following the Piercean model however, this research analyses fashion as an overlap of both symbolic sign and indexical sign. In explicating these terms, Chandler’s descriptions are adopted in his words as follows: “Symbol/symbolic: a mode in which the signifier does not resemble the signified, but which is fundamentally arbitrary or purely conventional - so that the relationship must be learnt” Symbolic signs bear no remarkable resemblance to their objects. Their significance therefore must be learnt. Symbolic signs are inculcated into the knowledge of a person through the socialisation process. For example, tribal marks were adopted in the African
traditional society to indicate family lineages. A foreigner will not understand the significance of the different tribal marks until he is initiated into the social system.

Similarly, Indexical sign is defined by Chandler thus: “Index/indexical: a mode in which the signifier is not arbitrary but is directly connected in some way (physically or causally) to the signified - this link can be observed or inferred” Indexical signs, in essence, are ‘pointers’ they are like the demonstrative pronouns ‘that’ ‘those’ ‘this’ which indicate their referents. Indexical signs exhibit observable links between the signifier and the signified; they are necessary signs. And as put by Chandler, are “like a fragment torn away from the object”

From the foregoing, the position of this research is that Modern Fashion is both a symbol of and a pointer to the various changing senses of identity occasioned by the post-colonial experiences of the Nigerian woman. It “is a matter of fact” pointer to the post-colonial disorientation and does not necessarily require an interpretive mind to link, because the changing fashion statements bear observable link with the post-colonial situation that it favours at a point in time. At the same time, elements of the traditional fashion as they are used as symbols of class, age, occupation, marital status and what have you, remain evident in the fashion statement of the modern Nigerian woman. It is then justified to proclaim the modern Nigerian woman’s fashion as a hybrid, hence, a sign of post-colonialism.

1.3 Post-Colonial Feminism

Rather than be a separate entity, the post-colonial feminism is an offshoot of colonialism that arose out of the sense of neglect perceived by the feminists in the colonial discourse. “Postcolonial feminism has never operated as a separate entity from post-colonialism; rather it has directly inspired the forms and the force of postcolonial politics.” (Raj, 2013; 130) The informing opinion is that post-colonialism is male-centred and has excluded the woman, and the informing question: “where are the women in the theorizing of post-coloniality?” (Boyce, 2003; 60) It is in a bid to answer this fundamental question and to provide a place for the woman within the framework of post-colonialism that the feminist post-colonialism becomes a necessary invention.

To further justify this claim, Tyagi (2014) analyses how greatly gendered the proponents of the theory of Post-colonialism were. She says:

Edward Said’s seminal study Orientalism itself accorded little attention to female agency and discussed very few female writers. Homi K. Bhabha’s work on the ambivalence of colonial discourses explores the relationship between a “colonizing” subject and a “colonized” object without reference to how the specifics of gender might complicate his model.” (45)

By implication, the proponents of the post-colonial theory never had the condition of the woman in mind from the outset.

Therefore, in defining the sphere of post-colonial feminism, Tyagi (2014) states that it is primarily concerned with the representation of women in once colonised countries and in Western locations. It concentrates on construction of gender difference in colonial and anti-colonial discourses, representation of women in anti-colonial and postcolonial discourses with particular reference to the work of women writers. The postcolonial feminist critics raise a number of conceptual, methodological and political problems involved in the study of representation of gender.

In Tyagi’s opinion, while postcolonial theorist struggles against the maiden colonial discourse that aims at misrepresenting him as inferior, the task of a postcolonial feminist is far more complicated. She suffers from “double colonization” She has to resist the control of colonial power not only as a colonized subject, but also as a woman. (Tyagi, 2014; 46)

Hence, Seeing the society through the woman’s eye, this research opines that the tendency of the modern Nigerian woman to indicate her preference for the western ideology by visibly shunning traditional dress codes haphazardly for western ones, not minding whether it is convenient for her or not, and doing this sometimes without fully grasping what the new codes mean originally and how they affect her “Nigerianess” is indicative of serious underlying post-colonial displacement. A modern woman is forced to see her native fashion as inferior, old-fashioned and unsuitable, even though they are evidently designed originally to cater for her fashion needs. And sometimes, within the social constraints, she finds herself without the two options but to solely abandon her native idea of fashion for the western one. And many times also, the woman does not shun out the traditional sense of fashion for the western one altogether; she tries to create a balance between the two, as she struggles to find her ‘self’ within her two contrasting worlds.
Together with ‘his’ feminist version therefore, this research finds the post-colonial theory suitable in examining modern fashion as a phenomenon internal to imperial nations signifying the disorientation associated with colonialism, and exhibited more significantly by the woman. The position of this research is that modern fashion in Nigeria reflects the disorientation occasioned by the colonial experience of the Nigerian people and this disorientation spans across many aspects of their endeavours and manifests significantly and most noticeably in the outward impression of the people - their fashion sensibility.

We employ this theory because the text under study has post-colonial settings without sparing to touch on post-colonial issues, especially such as relating to fashion - women’s fashion as it undergoes alterations and modifications between the traditional sense and the western one; as it changes to accommodate new western religion, western job, and new interest or belief which are associated with post-colonialism. The changing identity of the modern Nigerian women from crude to sophisticated, from unlearned to learned, from local to international, and other such transitions, are evident upon their fashion statements. In the texts, we see women going back and forth between the western fashion and the Nigerian native fashion, not knowing which to prefer because on the one hand, the western fashion is the dreamland, it affords them better social and economic dispositions than the traditional one. And on the other hand, traditional fashion is more convenient because it is originally designed and defined by the Nigerian woman and with the Nigerian woman in mind.

2. METHODOLOGY

This is a qualitative research which for the most part involves the analyses of the primary text. Materials gotten from the library and the internet constitute the sources employed in data collection, analyses and explications and in validating the theories used in the data analyses.

2.1 The Book and The Writer

Chimamanda Ngozi Adichie is a Nigerian novelist, non-fiction, and short-story writer. As a seasoned Nigerian writer, she has been called “the most prominent” of a “procession of critically acclaimed young Anglophone authors that is succeeding in attracting a new generation of readers to African Literature. Chimamanda was born on September 15, 1977 in Enugu, Nigeria, but she is a native of Anambra State. She had her secondary education at the University of Nigeria Secondary School; she then moved on to study Medicine and pharmacy at the same University, but only for less than 2 years before proceeding to U.S.A to study Communications and Political Science. Chimamanda possesses a Masters’ degrees in creative writing and in African Studies respectively.

On fashion and identity, Chimamanda, when she first appeared in the writing scene in the U.S, tried to dress more subdued in an attempt to be taken more seriously but soon realised that her personal style had the right to shine through. She once informed that life in America made her make conscious efforts to create an identity which reflected well in her fashion sense. (web 1) This her view on the subject of fashion is made manifest in the characters of Americanah, especially the female ones.

Chimamanda has offered several revealing interviews about her personal life, both as a Nigerian female writer in diaspora and a feminist. She revealed in one TEDxEuston talk in April, 2013, how she was going to repress her fashion sense just to be taken seriously as she went to teach her first writing class in the U.S. she said that “I really wanted to wear my shiny lip gloss and my girly skirt but I decided not to, instead, I wore a very serious, very manly, and very ugly suit… If a man is getting ready for a business meeting, he doesn’t worry about looking too masculine and therefore not being taken seriously. If a woman is getting ready for a business meeting, she has to worry about looking too feminine and what it says, and whether or not it will be taken seriously.” She however concluded that people should wear whatever they feel comfortable in. (Web 2)

“I was raised to care about my appearance, but when I went to U.S, I internalised the idea that if a woman wants to be taken seriously, she can’t seem to care much about her appearance.” She added in one of her interviews with BBC news. She however took her stand by pointing out “I don’t care very much about what anyone else thinks” (BBC News, 2016)

Recently, Chimamanda became an ambassador of a make-up line, Boots. Being the face of No7 further strengthens her claim to personal identity. She continues to hold that she can be an African feminist and be fashionable. -only an ‘African Feminist’ can afford to be, even if she resides in the United States. This claim reflects her traditional and post-colonial allegiances, and presents it without reserve in her fashion statement.

Americanah is a book of many stories, however, one major cord seems to conjoin these stories and it is the cord of disillusionment occasioned by Africans’ post-colonial experiences at home and abroad. Wesley Macheso discusses this concern in his post “The 21st Century African as a Cosmopolitan Individual in Chimamanda Ngozi Adichie’s Americanah, 2015” where he says:

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The portrayal of the 21st century African as a cosmopolitan individual in Chimamanda Ngozi Adichie’s *Americanah* reveals the new attitude that Africans have regarding their identity in the global village while at the same time exposing the challenges of the Afropolitan approach that oftentimes culminates in disillusionment in African émigrés who see themselves as citizens of the world.

He further clarifies that:

A cosmopolitan individual is defined as someone who shows cultural diversity by exhibiting the influence of many countries and cultures… they are known by their funny blend of London fashion, New York jargon, African ethics, and academic successes…what is manifest is the extent to which the modern adolescent African is tasked to forge a sense of self from widely disparate sources. (Web 3)

This identity crisis with which post-colonial Africans are faced in diaspora is made evident in their mismatched and enigmatic fashion sense which is neither traditional enough to be called African nor modern enough to be called Western.

*Americanah* (2013) a 477-page novel divided into seven parts, is a narrative spanning thirteen years and three continents, touching on race, gender, and the search for identity among many other themes. The story opens on Ifemelu’s preparation to return to Nigeria after thirteen years in America, as she sits in the salon making her hair. Adichie uses flash back to reveal how military regime in Nigeria and its attending socio-political upheaval which includes strike actions in universities have triggered Ifemelu’s emigration. Her migration severs the romantic relationship that exists between her and Obinze, her secondary school lover who also later goes in search of a better life for himself in London. Before her relocation to America, Ifemelu and her school friends have nurtured a surreal image of America which she, upon her entry into America discovers to be a mere illusion. She experiences first-hand the challenges of immigrants in America. It is in America that the ‘unfashionability’ of the colour of her skin and the texture of her hair dawns on her. She dates Blaine, a highly principled sanctimonious professor at Yale with whom she finds conversation tedious and wearisome. She later dates Curts, a wealthy white man. She becomes a successful blogger but later returns to Nigeria and attempts picking up the pieces of her romance with Obinze who is now wealthy, married and divorced.

The novel is preoccupied with the discourse of post-colonialism and its attendant effects upon the situation of the country. On the long run, all the preoccupations of the novel exhibit post-colonialism. Some of the preoccupations are: religious hypocrisy, political instability, migration, diaspora, identity crisis, imperialism, and economic survival, while fashion itself is employed to reflect all the themes. That is, in their fashion statements, their post-colonial experiences are signified.

### 2.2 Fashion and Sign In *Americanah*

A Nigerian woman is taught that silence and complacence is virtuous, hence, crisis ensued when one woman was assumed to have raised her voice in her own defense. Defying a male professor by any woman was as severe as fighting him in a physical duel and throwing him. However, these women have their silent way of telling their stories. They do this consciously or otherwise in their fashion. Since post-colonialism was fashionable in this story, it is only logical that fashion would signify it. Some of the very many ways in which this is done are examined.

Fashion, however covertly, is the first port of call in the appraisal of an individual’s identity, conversely, fashion taste and sensibilities are largely influenced by the individual’s identity. The consequence of this symbiosis is that the individual’s fashion taste changes as their identity changes. The double consciousness of Black female in the novel is revealed by her constant struggle to uphold her individual Black identity while yet seeking acceptance into the American social life or the Nigerian postcolonial setting. This fact is mirrored in the personalities of Ginika. Uju, and subsequently, Ifemelu as much as other black women in America.

The hair is one recurrent symbol with which Adichie relates the fashion experience of Nigerian women both at home and in diaspora as a large scale reflection of Post-colonial hybridity and mimicry. She decries the need for
the Nigerian woman to modify the texture of her hair or hide it away to adopt the modern identity of the globalised world. To this, Kerry Manzo in his appraisal of *Americanah* (2013) says “A common assumption is that Black standards of beauty, especially with regard to hair, are entirely derivative of white standards of beauty, and therefore at some level, an expression of self-loathing or feeling of racial-inferiority.” Going by Manzo’s position, the idea of fashion has to be Western to be fashionable, hence the need for Nigerians to attempt alterations to their identities so as to secure for themselves their ‘national honour’ in the western world. It therefore translates that every time a Nigerian woman alters her home-made idea of fashion to imibe the imperial idea, she implies her conformity, however reluctantly.

The importance of the Nigerian woman’s hair, to her, her husband, her children, her national integrity, and, to summarise these, her identity, cannot be overemphasised, yet, the Nigerian standard on hair is highly conflicting with the western as much as the textures defer across these boundaries. The hair thus comes up as a very vital symbol in the discourse of post-colonial identity.

To begin with, Adichie takes Ifemelu to a salon to have her hair braided for her journey home. Braids is a style of hairdo that she doesn’t get to do every time because of the constraints, but this time, she has to take the hot afternoon train to Trenton, just to make her braids. Ifemelu is firm about getting braids as much as she is about returning to Nigeria. This implies that the hairdo has a strong connection with her identity as a Nigerian and to be truly determined to restore her banished identity as a Nigerian, where to start is from aligning herself with Nigerian hairstyle. Hence, going by Peirce’s semiotics, the hairstyle is a symbolic sign, though it has no direct link with Nigeria so that anyone can see why “braids” is a signifier of “Nigerianess”, it is conventional that Nigerians should wear braids while in Diaspora, so that anyone who is familiar with this convention is able to link the two. Salon where braids are made is only found among the blacks and the hairstyle, we learn, is suitable for only kinky hair (Nigerian type) which alone can support its attachment. Thus, by wearing her braids, she can constantly bring back to herself a sense of home which she has lost and thus prepare herself psychologically for the return home.

The same symbol of hair is repeated severally in the book. On page 41, Ifemelu is described as growing in the shadow of her mother’s hair. The elegance of Ifemelu’s mum’s hair reflects upon her person, her disposition to life, her simplicity of nature, her passion; her essence. These are the things that she had which Ifemelu didn’t have, and this is why Adichie said that she grew in the shadow of her mother’s hair-not her mother’s person. Adichie therefore resolved that in cutting the hair, the woman’s essence left her. We should however not lose track of the reason why she had to cut the hair in the first place. In cutting her hair, Ifemelu’s mum suggested her rejection of her old allegiances. This resonate the biblical “old things are passed away” The hair therefore strikes us as an indexical sign in this context. One can hence safely conclude that in casting off a very significant fragment of herself, Ifemelu’s mum intended to symbolically cast-off old nature. It does not require any interpretive mind to create a link between a person’s hair and her nature. The hair is a fragment torn away from the person. There is a significant way in which someone’s identity in sculpted out and woven into the fabrics of their fashion.

Obinze’s mum is another character whose hair is used to reflect her identity. Her wearing a low-cut hairstyle is one feature that distinguished her as a professor at a time when such level of academic attainment was not very common among women. And not only that, it also served as a complimentary to her daring nature, as we have been previously acquainted with her news of fighting a professor, who was a male, and defeating him. Even though we would learn later that she only fought him by making him apologise to her for slapping her. Such a character as Obinze’s mum would not be done justice to if she were made to wear strong, dark lustrous hair like Ifemelu’s mum. She is a woman whose feminity is not depicted in her compromise or complacence, but in her assertiveness and self-assurance. She would, in a typical Nigerian setting, be regarded as being masculine; hence Adichie puts her on Low-cut. Her hairstyle is therefore a sign of her non-conformist nature, her vast learning and her place among her contemporaries who were mainly men. This will also suffice for a symbolic sign, since it is context-related.

Moreso, if we look beyond the surface, the hair as a fashion tool is used suggestively in a number of cases in the story. We analyse Ifemelu’s tutorial to Aisha on the natural hair as is given in page 12:

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She touched Ifemelu’s hair “Why you don’t have relaxer?”

“I like my hair the way God made it.”

“But how you comb it: Hard to comb.” Aisha said

Ifemelu had brought her own comb. She gently combed her hair dense, soft and tightly curled, until it framed her head like a halo. “It’s not hard to comb if you moisturize it properly.” She said, slipping into the coaxing tone of the proselytizer that she used whenever she was trying to convince other black women about the merit of wearing their hair natural. Aisha snorted.

Ifemelu here plays the sympathiser-with Aisha and other black women like herself, on the need to embrace their black nature, to not opt for the seeming easy American standards that will eventually damage their essence. Ifemelu, after living 13 years in America and being sufficiently convinced that the American standards are not good enough for her or any black woman at that, vested in herself the duty of enlightening other women on the need to embrace their “self” and that where to start is from their hair: that is where Ifemelu herself started. By saying “It’s not hard to comb if you moisturize it properly.” Ifemelu suggests that the coarseness of the African hair is, in a way, linked with the harshness of the situation in Nigeria, and the journey into relaxing one’s hair texture is also likened to the physical journey every emigrant makes to the west for easier lives. The eventual relaxed texture of the hair would mean the supposed achieved American dreams, but everybody knows that it is only a matter of time before a relaxed African hair begins to react to the chemical treatments. Therefore in begging Aisha to moisturise the natural hair properly for combing, she suggested that if Nigerians will put the right attitudes into dealing with the situation native to us, it will not turn out as difficult as it looks. And Aisha’s decided snorting response implies her resolve to take the short cut anyway. It has already been said of her to have clothed herself with the “I must survive” attitude by dating two Igbo men together because to her, they take care of women “real good”

Thus, the hair metaphor is adopted to tell the stories of subjugation, oppression, misrepresentation and survival. One cannot but feel the whole vibe about hair as drawn out in the long blog-post on page 297. The social distastefulness of African natural hair in America Ifemelu sums up thus:

… (By the way, can we ban Afro wigs at Halloween? Afro is not costume, for God’s sake.)
Imagine if Michelle Obama got tired of all the heat and decided to go natural and appeared on TV with lots of woolly hair, or tight spiral curls...she would totally rock but poor Obama would certainly lose the independent vote, even the undecided Democrat vote.

The struggle to be heard is a long fought and lost battle between the Occident and the Orient and this defeat is daily worn by the Nigerian woman. It is not even a battle for superiority, it is just in a bid to be allowed to survive that the black fashion is employed, but this is still too much of a luxury for the imperial power to allow. Ifemelu said: “that it was absurd how women’s magazines forced images of small-boned, small-breasted white women on the rest of the multi-boned, multi-ethnic world of women to emulate.” To suggest that America lived in oblivion of the existence and fashion need of the transnational, post-colonial black women, and the black women in turn lived in acknowledgement of this fact-they could not do otherwise.

The boundary between fashion and professionalism has blurred so much that it is only a matter of common sense for any émigré professional to make their look as close to American as possible, hence severing themselves from their African identity to take up a new identity in order to get by. When aunty Uju finally passed her exam and was preparing for her interview she declared “I have to take my braids out for my interviews and relax my hair. Kemi told me that I shouldn’t wear braids to the interview. If you have braids, they will think you are unprofessional.” Ifemelu who could not see the link between professionalism and the individual’s hair asked if there were no doctors with braids in America to which aunty Uju replied “I have told you what they told me. You are in a country that is not your own. You do what you have to do if you want to succeed” (119).
To Ifemelu, Aunty Uju’s appearance when she came to pick her at the airport was signifying something beyond the grasp of the naked eyes. Aunty Uju’s braids were rough and her ears bereft of earrings. This became to Ifemelu a sign. Ifemelu could tell right away from the airport that “There was something different about her…” (104). Aunty Uju’s appearance was a symbolic sign, suggestive of her frame of mind. Ifemelu would later confirm that there were frustrations in Aunty Uju’s life which included trying to pass her medical examination among other challenges that American émigrés faced.

Soon afterward, after life in America had dealt heavy blows on her, Ifemelu found herself in a situation identical to Aunty Uju’s and she had to make a difficult choice between taking the job that Curt helped her get or keeping her natural hair. She made the difficult but important choice of straightening her hair so that she could get the job. Here again Saussure’s dyadic model of sign is found very instrumental in explicating Ifemelu’s post-colonial situation:

Her hair was hanging down rather than standing up, straight and sleek, parted at the side and curving to a slight bob at her chin. The verve was gone. She did not recognise herself. She left the salon almost mournfully; while the hairdresser had flat-ironed the ends, the smell of burning, of something organic dying which should not have died, had made her feel a sense of loss (203).

Ifemelu’s burnt hair is the physical form of the sign; it is the signifier while the loss of her original identity psychologically attached to the hair is the signifié. (the signified). This is a symbolic sign. Submitting her natural hair to hot iron to be replaced with straight hair, meant to Ifemelu more than a change of look. It was a change of identity. It was a loss of who she originally was. That was the moment she became dead to her national self and it remained so until she made a return to her natural texture. Whereas, straight hair to America signified professionalism, it symbolised a huge loss to Ifemelu. But she, like other female émigrés, had to give up her national identity in order to survive her trans-national difficulties.

A blog-post that reads:

When it comes to dressing well, American culture is so self-fulfilled that it has not only disregarded this courtesy of self-presentation, but has turned that disregard into a virtue. “We are too superior/busy/cool/not-upright to bother about how we look to other people, and so we can wear panamas to school and underwear to the mall” (129)

Explains the occidental ideology of fashion and why it contrasts significantly with the oriental. It hence holds that to survive in corporate America, a Nigerian woman has to filter and adjust her idea of the fashionable; she has to get over herself and take her look a little less seriously. When “fat” is a compliment in Nigeria but an insult in America (5), when skinny is unfashionable in Nigeria but totally cool in America (5), when shapeless dresses are signs of poverty and/or impropriety in Nigeria but trendy in America (.126), when, in America, you have to look untidy and your ears bereft of earrings to look studious (104), when your kinky hair offends the officials so that you have to wear straight hair to be welcome to the cycle of the professionals in America (119 and 202), hybridity of identity, as projected in one’s fashion, becomes germane to one’s survival in America. Fashion, in short, is being employed to tell the story of survival.

A typical case of mimicry and hybridised identity stemming from postcolonial heritage is made manifest in the person of Michelle Obama:

“…she mourned when Michelle Obama was clamped, flattened, made to sound tepidly wholesome in interviews. Still, there was in Michelle Obama’s overly arched eyebrows and in her belt worn higher on her waist than tradition would care for, a glint of her old self (354).

It is significant that Michelle Obama is a passive subject of this discourse and the verbs “clamped” and “flattened” as they relate to Michelle Obama’s appearance let on that she is involuntary of that look but must wear it, to submit her personal identity and make it sub-serve the American social identity.
This hybridity, we will also learn, becomes indispensable even when emigrants return to their nationalities, such that we don’t only find hybridised identities among trans-national Nigerians, but we also find them among returnees who, because, of their long sojourn in the west, have lost a significant part of their national identity, what they become is therefore neither sufficiently bleached to be called American nor tanned enough to be Nigerian. In their fashion statement, they exude cultural conflict and post-colonial disorientation. Their fashion is a signifier of their disillusionment. Doris, Ifemelu’s colleague at her Nigerian job exemplifies this character. Here is the narrator’s description of her:

Doris, thin and hollow–eyed, a vegetarian who announced that she was a vegetarian as soon as she possibly could, spoke with a teenage American accent that made her sentences sound like questions...Her long sisterlocks were sun-bleached a coppery tone, and she dressed unusually-white socks and brogues, men’s shirt tucked into pedal-pushers –which she considered original, and which everyone in the office forgave her for because she had come from abroad. she wore no make-up except for bright–red lipstick, and it gave her face a certain shock value, that slash of crimson, which was probably her intent, but her unadorned skin tended towards ashy grey and Ifemelu’s first urge, when they met, was to suggest a good moisturizer. (40)

Such an unusual fashion that even a fellow returnee could not place exemplifies the different heights of post-colonial disorientation that Nigerian women manifest. It becomes obvious that this character has missed it somewhere between being a Nigerian and being a black diaspora. This makes her appear highly comical in Nigeria as much as she would in New York. This description of hers as offered by the writer comes in handy for us to be able to relate with the unusualness of her role as would be learned later. The indecisiveness that she exudes has previously been hinted at in the description of her mismatched fashion. a sign of post-colonial disillusionment.

3. CONCLUSION

The Nigerian woman at home is disillusioned with foreign dreams which she pursues (practically or religiously) and when the dream seems to have come through, she finds that her identity as a Nigerian is a thing of dignity only as far as her nationality can contain her. Therefore, a lot has happened in between the woman’s idea of herself as a Nigerian and as a citizen of the world to alter her traditional perception of self and to downplay her “Nigerianness”. Her need to survive the double misfortunes of being a citizen of an oriental nation, and of being a woman, calls for serious complications and alterations of her “self” and in effect, her fashion. Hence, not knowing who else she is but a Nigerian woman, and not being fully able to let go of this self, she, through her fashion, expresses her hybridity.

The research has aimed at a materialistic analysis of the postcolonial tendencies which have been hitherto overlooked by scholarship. It was found that fashion has been hitherto overlooked because it has been labelled trivia and effeminate, whereas, it is the most outward manifestation of postcolonial underpinnings and vital in the understanding of the more underlying ones.

It has been demonstrated in this discourse that fashion is a marker of identity and the fashion of the colonised is a veritable testimonial of the aftermath of colonisation. With examples drawn across the female characters of Americanah at home and away, it has been argued that the post-colonial situation of Nigerians has affected the self-perception of the woman and so the fashion choices of the female characters in the novel signal the result of this self-perception; of hybridity and of double consciousness. And not only has fashion signified underlying post-colonial tendencies, it has also been analysed as a valid semiotic tool capable of eloquently communicating underlying meanings.

REFERENCES


EMPOWERING WOMEN IN RURAL AREAS THROUGH INFORMATION AND COMMUNICATION TECHNOLOGY FOR SOCIO-ECONOMIC GROWTH

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ABSTRACT

Information has become the principal determinant of the progress of nations, communities and individuals. Information and Communication Technology (ICT) is a wonderful tool which benefits all spectrums of people in the world and reach millions of people every day. ICT plays various roles in empowering the women such as offering entrepreneurial opportunity, breaking isolation, providing linkages to inputs and markets, assisting small and medium size business, reducing poverty, and illiteracy and improving income and savings of rural women. There is a potential for ICTs to purge gender discrimination and to empower women in society. But with science, technological innovations and socio-economic changes, women, even rural women, are progressively starting to utilize various kinds of technological instruments. Amongst the various kinds of ICTs the cell/mobile phone, internet and computer system have reached a significant place. These technologies are providing knowledge, economic independence, social security, social networks and self-confidence to women in rural areas, mainly young girls seeking employment opportunities and working in small and medium level towns. An attempt has been made in this paper to explore women’s empowerment through ICTs in rural areas. The problems affecting use of ICT devices include absence and erratic supply of electricity, lack of ICT skills, low level of awareness and so on. Government should provide basic amenities to the rural dwellers to improve their socio-economic well-being, especially in the area of ICT.

Keywords: ICT, Women, Empowerment, Growth,

1 INTRODUCTION

Information and communication technologies (ICT) comprise a complex and heterogeneous set of goods, applications and services used to produce, distribute, process and transform information. (Mittal et al., 2010) The ICT sector consists of segments as diverse as telecommunications, television and radio broadcasting, computer hardware and software, computer services and electronic media (e.g., the Internet, electronic mail, electronic commerce and computer games) as well as the content of these media.

Information and Communication Technology (ICT) has become a potent force in transforming social, economic, and political life globally. Without its incorporation into the information age, there is little chance for countries or regions to develop. Most women within developing countries are in the deepest part of the divide further removed from the information age than the men whose poverty they share. (ITU) ICT can be an important tool in meeting women’s basic needs. A few decades ago, the post, newspapers and radio were the major communication sources in rural areas and rural people depended on these for their information needs. In the present decade, through the invention and penetration of ICTs, the situation has changed considerably. Nigeria particularly has reached a better position in ICT usage especially in rural areas. ICTs comprise a complex and heterogeneous set of goods, applications and services used to produce, process, distribute and transform information. ICT consists of segments as diverse as telecommunications, television and radio broadcasting, computer hardware, software and services and electronic media. (Munyua, 2000) Television and mobile phones/cell phones and to some extent the internet have reached a remarkable position.

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Traditional and modern ICTs can be used concurrently to speed up the circulation of information. In many African countries, ICTs are used to greater and lesser degrees in drama, dance, folklore, group discussions, meetings, exhibitions, demonstrations, visits, farmers’ field schools, agricultural shows, radio, television, video, and print. Solar, satellite, and fibre-optic technologies are now in use for computers, telephones, and facsimile. (Odiaka, 2011) Telecentres have been established in villages, where appropriate, rural female farmers can tap these resources and access information using the new ICTs, such as e-mail, the World Wide Web, electronic networks, teleconferencing, and distance-learning tools. Information can empower rural females to participate in decision-making, exchange ideas with others in developed and developing countries, and improve the quality of life of the people of Africa. ICTs have changed education, training and service delivery.

2 INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

According to ITU, Information and communications technology (ICT) is an extensional term for information technology (IT) that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals) and computers, as well as necessary enterprise software, middleware, storage, and audiovisual systems, that enable users to access, store, transmit, and manipulate information.

The term ICT is also used to refer to the convergence of audiovisual and telephone networks with computer networks through a single cabling or link system. There are large economic incentives to merge the telephone network with the computer network system using a single unified system of cabling, signal distribution, and management. ICT is an umbrella term that consist mainly of the following; mobile phones, internet, satellite system, personal computers, radio broadcasting, television broadcasting, cloud computing, other New ICT devices.

ICT is a broad subject and the concepts are evolving. It covers any product that will store, retrieve, manipulate, transmit, or receive information electronically in a digital form (e.g., personal computers, digital television, email, or robots).

Objectives of ICT in this Paper include the following:

- To investigate women’s empowerment through ICTs in rural areas.
- To analyze the socio and economic inclusion of rural women by ICTs.
- To identify the barriers of usage of ICTs by women.
- To examine the role of the Government and the NGOs in promoting the IT sector for women’s development.
- To suggest strategies to overcome barriers and offer some practical suggestions for policy makers to improve women’s access to ICT.

3 IMPACT OF ICT IN WOMEN EMPOWERMENT

Information and Communication Technology can play a veritable role in empowering women. ICT improves the income of rural women. ICT has the ability to break and reduce poverty, breaks systematic discrimination and violence against women and provide access to financial markets. It offers entrepreneurial opportunity for rural
women, enhance decision making and ability to participate in development programmes. (Odiaka, 2011) Other roles are ability to break isolation of rural women, provides linkages for small scale enterprises, assist small and medium size enterprises, transformation of the traditional roles of women, open economic opportunity from informal to formal sector. Personal business development and growth help women overcome illiteracy. During oral discussion with the respondents, it was also said that they have been able to set up business centres and call centres where people gather to make their calls. This has improved their income and savings.

According to UNDAW (2002), ICTs provide unique opportunities for economic growth and human development. They can shape and enhance a wide range of development applications — from electronic commerce to access to financial markets; from generating employment to providing opportunities for investment to entrepreneurs, in particular small and medium-sized enterprises; from improved agricultural and manufacturing productivity to the empowerment of all sections of society; from long distance education to telemedicine, from environmental management and monitoring to prevention and management of disasters (Nagamani, 2016). The potential to help foster sustainable development, empower people — women and men, the young and old, build capacities and skills, assist small- and medium-sized enterprises, reduce poverty, and enhance participation and informed decision-making at all levels is enormous (UNDAW, 2002).

ICT offers economic opportunities (both in salaried employment and entrepreneurship, in the ICT sector itself, and in jobs enabled by ICT in all sectors) at all levels. In developing countries there are growing possibilities for outsourced service-sector jobs. Globally IT-enabled communications businesses offer possibilities of entrepreneurial opportunities for women. The technology inherently makes possible flexibility in time and place that offers great possibilities for women in view of their multiple roles (UNDAW, 2002). The sector also gives the possibility for women everywhere, despite their location, of connection to the global economy through e-commerce as producers and distributors of goods and services. For this, women need management capability, trade infrastructure, credit, and an enabling policy environment. ICT-enabled information access can break the isolation of rural women, giving them the knowledge to make decisions to improve their economic situation. ICT provides virtual space and linkages that favour small-scale enterprises, where women’s entrepreneurship is more frequently found. Information is a prerequisite for empowerment (World Bank, 2002), and participation drives empowerment by encouraging people to be active in the development process, to contribute ideas, take initiative, articulate needs and problems and assert their autonomy (Diom, 1996).

ICT is the latest in the series of continuing technological revolutions and is argued to have significant influence on gender empowerment (Van-Ark et al., 2002). Informed citizens according to World Bank report (2002) are better equipped to take advantage of opportunity, access services, exercise their rights, and hold state and non-state actors accountable. Social influences on women’s relationship to technology affect their attitudes toward ICTs. Obayelu and Ogunlade, (2006) posited that there are great potentials of ICTs as tools for enhancing people’s daily lives whether by increasing access to information relevant to their economic livelihood, better access to other information sources; healthcare, transport, distance learning or in the strengthening of kinship. The result from study conducted by Obayelu and Ogunlade (2006) showed that, the most common of the ICTs related to poverty alleviation programs in Nigeria are telephone and radio. While other commonly uses of traditional media include: Print, video, television, films, slides, pictures, drama, dance, folklore, group discussions, meetings, exhibitions and demonstrations (Munya, 2000). The use of computers or the Internet is still restricted to very few people living in urban centres. ICTs have the potential to broaden and enhance access to information and communication resources for remote rural areas and poor communities, to strengthen the process of democratization and to ameliorate the endemic problem of poverty (Norrish, 2000).

3.1 KNOWLEDGE ACQUISITION

In today’s developing environment usage of Information Technology has become a day-to-day activity which has exposed women to the new technologies, and hence are not difficult to be trained on them. It is observed that women in general have good concentration power owing to their nature of work, and hence are easily trained to acquire any new skills (Gurumunthy, 2004). As the women at lower strata are constrained to the homes, if we can get the technology to the women at home, we will be sure to succeed in empowering them. NGO’s and Government departments must plan training programs, to provide the required skills and establish groups for the follow up action.

3.2 KNOWLEDGE NETWORKING SYSTEM

Women stand to benefit tremendously from the inroads laid by ICT in the domain of knowledge networking. At the very conceptual level, ICT have the potential to digitally link each and every woman in the world in a star topology network, which opens up endless possibilities for information exchange (Mittal et al., 2010) This mechanism could be used by women in creative ways, both to communicate with other people who are online, and also to disseminate information to people in the outside world who are not online through the use of
convergence and hybrid technologies such as community emails, community radio broadcast, telecentres, newsletters, videos etc. This mechanism forms the skeletal process through which women communities could overcome the constraints of seclusion, mobilise resources and support, reach out to new markets and open up avenues for life-long learning.

3.3 WOMEN’S ACCESS TO THE INTERNET

The gender divide within the digital divide can be seen in the lower numbers of women users of ICTs compared to men. One illustration of this is the number of women Internet users. The majority of the world’s women do not use the Internet (Nagamani, 2016). They are excluded from the World Wide Web. The digital divide within countries broadly reflects the gender divide. Women are in the minority of users in almost all developed and developing countries. The trend for differentiation in use starts early, in some countries boys are five times more likely than girls to use home computers and parents spend twice as much on ICT products for their sons as they do for their daughters. It is extremely difficult to get data on use by gender by country for developing countries.

3.4 CAPACITY BUILDING OF WOMEN

Several organizations are building the capacities of girls and women to make ICTs accessible and useful to them. At one level, girls and women are being provided general training in ICTs for ICT-related jobs; at another, women in business, women entrepreneurs and women in the professions, are systematically being supported for skill enhancement, career growth and greater work efficiency (Okon, 2013). In most part of Nigeria, socially disadvantaged women have used radio and video to document and disseminate traditional farming practices, to reach policymakers, and to archive their community-based development work. Such development activities in fact have deeper meanings; they reflect the recording by women of their own history and reclamation of their knowledge.

4 APPLICATION OF ICT IN RURAL AREAS FOR SOCIO-ECONOMIC GROWTH

One significant ICT modern communication tool is the internet. With help from international organizations like the World Bank, and UNDP’s Millennium Development Goals, national and international development agencies and corporative bodies, rural development initiatives are introducing the internet into rural areas through the implementation of telecentres. These centres are also known as village Information centres, information centres, information kiosks. They provide internet and computer-based information and training to rural people. They are run by rural women who are associated with village Self-help Groups (SHGs). (World bank, 2005). These information centres help to empower rural women’s entrepreneurship and provide computer training to young girls who can then look for clerical jobs near their villages. However, the centres are not used much by women for their information needs. Rural women in developing countries may be able to sell their products directly without going through intermediaries. One of the most powerful applications of ICT is Electronic commerce. E-commerce refers not just to selling of products and services online but also to the promotion of a new class of ICT-savvy women entrepreneurs in both rural and urban areas. E-commerce initiatives can link producers and traders directly to markets at national, regional and even global levels, allowing them to restructure their economic activities and bypass intermediaries and the male-dominated and exploitative market structure.

4.1 LIVELIHOODS

New ICTs provide opportunities to reorganize economic activities in ways that can bypass the traditional dependence of women producers on male-dominated and exploitative market structures, including “middle-

Figure 2: Individual Internet Usage by Gender and Age
men” (Munyua, 2000). In many places, initiatives are being tried that link women artisans directly to global markets through the Internet, as well as support their activities with market and production information. The CBOs are provided with cellular phones, and women have been trained to maximize the use of telephones for selling not only in their immediate neighborhoods but also reaching new markets within the city.

### 4.2 ACCESS TO INFORMATION

ICT can deliver potentially useful information, such as market prices for women in small and micro-enterprises. For example, use of cellular telephones illustrates how technology can be used to benefit women’s lives, by saving travelling time between the market and suppliers, by allowing women to call for product prices and by facilitating the constant juggling of paid and unpaid family activities. (Obayelu, 2006). Now a day’s many useful mobile apps are developed so as to provide different sets of information without going to the concerned places or authorities. So, this type of applications can help the rural women in many ways according to their livelihood.

### 4.3 EMPLOYMENT

Considering, then, how important the IT industry may be for the employment of young female professionals and if it is not now, it will be soon, the responsibility to create nondiscriminatory and comfortable workplace environments should fall heavily on the largest and most economically significant companies in the software sector. (UNDAW, 2002). However, ICT has played an important role in changing the concept of work and workplace.

#### Figure 3: Proportion of Private Sector Employees using Computers

![Figure 3: Proportion of Private Sector Employees using Computers](image)

More than one fifth of female employees (28.9\%) in the private sector used computer routinely in 2015/2016, compared to 21.9\% in 2012/2013 with a growth rate of almost 7\%. Although male employees usage was slightly less than females in 2015/2016 (25.96\%), they both reached the same percentage in 2012/2013, which reflects slower growth rate for male employees.

#### Figure 4: Proportion of Private Sector Entities having Access to the Internet

![Figure 4: Proportion of Private Sector Entities having Access to the Internet](image)

Private sector entities having access to the internet have increased from 54.7\% in 2012/2013 to 59.9\% in 2015/2016, with a growth rate of around 5.2\%.

### 5.0 BARRIERS TO USAGE OF ICT’S FOR WOMEN IN RURAL AREAS

- Lack of clear National Policy for promoting ICT for women’s development.
- Poor ICT infrastructure, inefficient telephone services, lack of electricity in many remote, far-flung areas, and frequent power cuts.
- Lack of computer skills on various areas including hardware and software installation and maintenance, internet and non-internet-based skills such as telnet, FTP, mailing etc.
- Limited online information in languages other than English.

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• Women’s time is at a premium. The barrier to ICT use includes the issues of information overload and the time consumed in searching for useful and practical information.
• Social and cultural barriers.

6.0 SUGGESTIONS TO IMPROVE THE USAGE OF ICT TO AVOID THE BARRIERS

• Equitable access to ICT technology and the autonomy to receive and produce the information relevant to their concerns and perspectives are critical issues for women.
• There is need to use a rights-based approach to ICT policy development, where everyone has the right to affordable access to ICTs.
• The question of where and how they can gain access to ICT becomes important. This is an area where intermediary organizations can help bridge the gap by email accounts, bulletin boards, search engines, mailing lists, and other useful functions serve as communication, networking and collaboration channels among women’s groups, and between women and the external sphere.
• Promote the enrollment of girls in ICT programs by providing incentives such as scholarships and awareness raising activities.
• Government and NGOs need to impart technical education on the use of ICT as a part of both formal and informal education systems and to initiate distance learning and vocational courses.
• Language access must be addressed as a serious barrier to gender equity on the international ICT policy level.

7.0 CONCLUSION

Rural woman’s needs are very specific; they need more local information rather than global information. Nevertheless, if the information centers disseminate information on agriculture, domestic developments, local marketing news, government schemes and health care in local languages, this will be very useful for rural people. The study therefore suggests that technological development is an urgent requirement for the socio and economic empowerment of rural women.

Majority of women in the developing world do not have access to ICTs due to a variety of barriers such as the infrastructural, social, cultural and linguistic. While it may be necessary for the progressive elite to mediate information dissemination, real democratization of information depends on making ICTs relevant to the majority and accessible to every woman. Today, print media and radio are used extensively by feminist groups for information dissemination. ICTs can strengthen these media strategies. Community access points such as telecentres can be a simple tool for conveying information to women that supports their social and political empowerment. Addressing the ICT arena is part of a larger struggle to build an information society based on protecting people’s right to communicate, own and use knowledge for their own ends, and resisting curtailments on freedom to use, share and modify information tools and content. ICT have the potential to reach those women who hitherto have been not reached by any other media, thereby empowering them to participate in economic progress and make informed decision on issues that affect them.

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GENDER EQUALITY AS A PANACEA FOR JOB SATISFACTION
(STAFFS OF EPE LOCAL GOVERNMENT EDUCATION AUTHORITY, LAGOS STATE)

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ABSTRACT
The relationship between workers job satisfaction and gender has been examined frequently. However, the results of many of the studies have been contradictory. Some studies have shown females to be more satisfied than men whereas other studies have shown men to be more satisfied than female. However, most of the researches in this area report no significant differences between the sexes in relation to job satisfaction. This study analyses gender differences in the key drivers of job satisfaction among a sample of Epe local government education authority in Lagos. Data was collected from sixty-nine (69) staff of Epe LGEA in Lagos. Using constructs from literature and items from tested scales a questionnaire was developed for the study. Of the 69 questionnaires administered only 60 were returned in useable conditions. The respondents were made up of, 50% female (30), and 50% male (30). The results indicate that there are no differences in the drivers of workers satisfaction between genders.

Keywords: Gender, Job satisfaction, Gender equality

1. INTRODUCTION
There is a saying, “gender is a fluid concept that shifts over time and place” (Mavin and Grandy, 2012). With the changes of social and economic forces, the number of female members is increasing in the labor market (Omar and Davidson, 2001). It shows that gender and management are attractive and large topic among the public. Regardless of the expansion of women in the workplace, there is still a problem that women are underrepresented at the top of organizations (Alvesson and Billing, 2009). In addition, the structure of gender also has an impact on organizational decisions about selecting higher level managers. Women face greater challenges compared to men. Meanwhile, there are more barriers that prevent them from entering high positions in organizations. For example, Brindley (2005) points out that the attitudes toward risk are different between females and males. Men are more likely to make risky judgments than women. Therefore, to understand the interaction between gender and management, as well as the factors that affect gender equality in non-profit organizations will be the main issues of this study.

In this study, gender equality is viewed as one of connections between gender and management. The significance of gender equality is extremely evident in the labor markets, not only to individuals and organizations but also to the society. For instance, people will feel respected when they are equally treated by organizations. Hence, their job satisfaction will be increased, which encourages them to work hard, achieve effectiveness as well as make a performance in the workplace (Drew, 2002; Atewologun and Singh, 2010). As for organizations, gender equality can increase productivity by making full use of the characteristics of both genders. As a result, organization will obtain substantial profits from it (Mählick and Thaver, 2010). Last but not least, to some extent, the situation of women in the workplace also reflects the economics. To put it simply, women in poor countries frequently tolerate unequal treatments, whereas the situation of women in rich countries is different because they are given opportunities to obtain jobs or positions by comparing to low-income countries (Pine et al., 2010).

The importance of gender equality cannot be neglected when we discuss gender and management. However, achieving gender equality within a whole society is not easy, both organizations and other external pressures play significant roles in promoting it (Williams et al., 2010). For any organization to be successful the satisfaction of their employees must be continuously ensured. Job satisfaction has to do with an individual's reaction to the job experience. It is how content an individual is with his or her job. Several variables are considered to be vital to job satisfaction because they all influence the way a person feels about their job. Such
variables include: pay, promotion, benefits, supervisor, co-workers, work conditions, communication, safety, productivity, and the work itself. Each of them figures differently in an individual’s job satisfaction. Workers satisfaction is a crucial aspect of an organization’s prosperity and goal attainment. It constitutes an important issue for management and workers in any organizational setting.

Gender is one of the universal dimensions on which status differences are based. It is a social construct specifying the socially, culturally prescribed roles that males and female are to follow. It involves those social, cultural and physiological aspects linked to males and females through particular social contexts. In the last couple of decades there has been increased interest in exploring factors influencing workers satisfaction with a specific focus on gender differences. For instance Clark (1997) in testing the idea that men and female in identical situations should be equally satisfied found that the average for females was lower in stature and income than for males, even though females reported higher levels of satisfaction. Medaiyese (2002) found that workers satisfaction declines with increasing levels of education and argues that higher levels of education tend to increase workers goal and income expectations. Ade (2001) found that males tend to show the lowest levels of workers satisfaction. Oloko (2010) affirms that gender is the difference between males and females working in gender-balanced groups have higher levels of satisfaction than those working in homogeneous groups. Fields & Blum (1997) affirms that workers who work in groups comprised of mostly males tend to show the lowest levels of workers satisfaction. Pook, Füstös, and Marian (2003) examined the effect of gender bias on satisfaction in a survey in Eastern Europe and reports that females are less likely to receive help from their managers toward advancement and that they are less satisfied than men with the work they perform as a result of being assigned less-challenging tasks, non-commensurate with their backgrounds.

However, Oloko (2001) reports that overall females have higher satisfaction than men and have even higher satisfaction in workplaces dominated by females. Oloko adds that males and females value flexibility differently, and once this difference is controlled for, gender composition in the workplace plays no role in determining satisfaction of female. This study examines differences in drivers of workers satisfaction due to gender for journalists in the print media in Nigeria. Previous studies in this area have looked at differences in workers satisfaction due to gender in various settings, and the results have differed. This study examines differentials in drivers of workers satisfaction arising from gender using the print media in Nigeria as a unit of analysis. Specifically, the study examines independent variables that have been correlated with workers job satisfaction and also the extent to which these drivers differ between male and female print media journalists in Nigeria being a male oriented profession where females find it harder to get into and remain than males.

Objectives of the study

- To examine difference between gender equality and job satisfaction in Epe Local Government Education Authority, Lagos State.
- Evaluate the significant difference between male and female staff job satisfaction

Hypotheses of the study

- Is there any significant difference between gender equality and job satisfaction?
- Is there any significant difference between male and female staff job satisfaction in Epe Local Government Education Authority, Lagos State?

2. LITERATURE REVIEW

Gender

Females have always had a lower status than males, though the extent of the gap between them varies across cultures, and time. Gender affects and often determines the roles that females play in social institutions, society and their occupations are no exception. Moser (2010) affirms that gender is the difference between males and females within the same household and within and between socially and culturally construed changes over time. These differences are often in responsibilities, access to resources, contracts, opportunities, needs, perception and views. The issue of gender goes beyond possession of the subjective sense of male or female behaviours that are considered normal and appropriate for sex differentials. As ascribed by the society, gender roles lead to assumptions about how people will behave and once these assumptions are widely accepted, they begin to function as stereotypes. Females are in general conditioned by societal and cultural pressures to adopt certain ideal behavioural patterns constant with the society’s expectations of how they must behave. It is believed in the Nigerian cultural set up that males are the ones who should have the dominant and aggressive qualities while the females must exhibit passive and dependent qualities. This belief has so permeated the society that any female that exhibits the set roles for males is regarded as a deviant and ill-brought up person. In present day Nigeria the situation and the society is rapidly changing. One of the most remarkable changes in the emancipation of female has to do with their emergence from the seclusion of their homes into business activities outside their homes.

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Across all societies known to mankind, work has always occupied prime place in people’s lives. However, the roles of female and males are usually defined in different cultures. Be it traditional societies or the so-called developed societies, females have been seen as care-givers, mothers and wives with the primary function of child rearing and taking care of the ‘domestic’ affairs. On the other hand, males are saddled with resounding functions of political, economic and military activities that require vellour. Giddens (2006) observes that there has never been any known society where females were more powerful than males. In the Nigerian context, the males have always taken the lead, although that is not to say that females have not made their mark in some circles; either in pre-colonial or post-colonial times. In traditional societies, the males hunted for games, while the females gathered fruits and coordinated other domestic affairs at the home front, including reproductive functions. The advent of modern capitalism, which moved production activities to the factory and pushed man away from the farm to paid employment, further reinforced the male’s dominant position in both economic and power relations. This dominant position is usually referred to as patriarchy. Men’s revered position of dominance over the years has been challenged owing to widespread agitations for equality of gender by feminist movement’s clamoring for change in status quo. The idea of the female’s place being in the kitchen is changing gradually and occupations like nursing, which was regarded as the female’s domain has been witnessing the influx of the male folk. Though globally, the ratio of male to female in the labour force is getting increasing, Soetan (2002) in an analysis of various sectors in Nigeria shows that men are more in the labour force with virtually all sectors dominated by men. Again, females are concentrated in agricultural, wholesale, and retail trade sectors, where they are mostly in the categories of self-employed (36.4%) and unpaid family workers (46.2%). The high representation of female workers in limited echelons of the public sector, but their virtual absence in the middle and low-level occupations in the private wage sector is in keeping with gender-based occupational segregation trends.

The United Nations Development Programme (UNDP) in its 2005 Human Development Report observes that female’s labour force participation rose by just 4 percent in 20 years (from 36 percent in 1980 to 40 percent in 2000). The UNDP report adds that in 55 countries with comparable data, the average female wage is three quarters (¾) of the male wage in the non-agricultural sector. In developing countries, females still constitute less than one-seventh of administrators and managers. Females occupy only 10 percent of parliamentary seats and only 6 percent of cabinet positions. Females in the labour force have been increasing in numbers over the past few decades with more and more moving into paid work. Females have also made considerable relative increases compared to men in school and university enrolment, graduate and professional education and in entering management and professional occupations. Females making inroads into the labor force is as a result of myriad of factors such as the changes in their domestic roles, monumental decline in the rate of child birth and increase in the age at which modern females give birth to children. Also the feminist agitation for gender equality and female empowerment has helped to create awareness that has motivated females to take up jobs in industrial organizations, which were stereotyped as men’s. Financial pressure is another push factor that gingered females into paid work. As a result of the high rate of unemployment of males, females are directly or indirectly forced to work to cater for the family. Also in a situation where the man’s income cannot support the family life style the need for double pay becomes a way out. Another driving factor for females into the labor force or paid work is the need for personal fulfilment. In addition, formal education has helped to reduce the gap between the male and female in the workplace. Females with requisite qualifications are now found in top management positions and boards of companies either in the private sector or in the public sector though their number is still relatively few compared with the males.

The consequence of these is that the status of females has improved. Females nowadays aspire for positions of authority in the workplace. They now have a voice in the workplace, even in jobs perceived to be the man’s work. It is however important to note here that the female’s responsibility for house work and child care affects the types of jobs many they prefer, since flexibility (in terms of hours and relatively easy entry exist/re-entry) enable them to combine work and family responsibilities more easily. Females tend to gravitate towards occupations where either because of their preferences and characteristics and/or because employers prefer to employ female in these occupations. Economic theories explain that it could be that occupations become “female” because of sex stereotyping. New-classical economic/human capital theory holds that preferences of female and employers are responsible for the concentration of female in flexible occupations. While family responsibilities can be expected to increase female preferences for flexibility occupations, the stereotyping of certain work can also be expected to affect the type of occupations opened to them.

Gender differences in the workplace typically stem from social factors, which influence the behaviors of men and female. Some organizations welcome gender diversity and encourage the inclusion of both sexes when making company decisions and offering promotional opportunities. Other organizations discourage gender inclusion and promote bias in the workplace. With most companies, gender differences add value and varying

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perspectives to an organization. Deaux and Enswiller (2003) in their survey of tasks perceived as male appropriate discovered that a good performance by a male is attributed to skill while the same performance by a female was seen to be the result of chance. Also good performance by the male was attributed to general intelligence, as female were constituted to be less intelligent than men and highly dependent on men. Independent of the task, man was rated as more skillful than females.

Job Satisfaction

OSREA (1992) Cited (Cook and Wall 1979) and refers to job satisfaction as the degree to which a person reports satisfaction with the intrinsic features of the job. Job satisfaction is an emotional response to job situation (Tella, Ayeni and Popoola, 2007) Ch'ng Chong, and Nakesweri (2010) refers to job satisfaction as the feeling that a worker has about his job or a general attitude towards work or job and it is influenced by the perception of one’s job. Chimankire, Mutandwa, Gadzirayi, Muzondo and Mutandwa (2007) quoted Smith (1969) perceive job satisfaction as the “extent to which an employee expresses a positive orientation towards a job”. According to Berry (1997), job satisfaction is defined as “an individual's reaction to the job experience”. The components of job satisfaction include the following: pay, promotion, benefits, supervisor, co-workers, work conditions, communication, safety, productivity, and the work itself. Each of these factors figures into an individual’s job satisfaction differently. One might think that pay is considered to be the most important component in job satisfaction, although this has not been found to be true. Employees are more concerned with working in an environment they enjoy. The need for employees’ job satisfaction cannot be overemphasized. Job satisfaction in organizations has been receiving increasing attention because it reduces employees turnover, absenteeism, tardiness, and health set-back due to stress. (Chimanikire et al.).

There are general beliefs that attitude and characteristics are influenced by gender Salami (2001) cited (Worell 1978) obsolete reference expressed that the roles of sex are cultural expectations about beliefs, attitudes and behaviors associated with masculinity and femininity. This attitude may have influence on job satisfactions. In some countries, the proportion of men to women employed in different occupations varies directly widely (Salami, 2001). This disparity may be due to gender discrimination and general belief that certain occupations should be tested for a particular sex.

Locke (1976) defines job satisfaction as a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences. Job satisfaction is an affective or emotional response toward various facets of one’s job and it has been of great interest to researchers and practitioners in a wide range of fields, including organizational psychology, public administration, and human resource management. Job satisfaction is important because of its implications for job-related variables. Results of studies such as Judge et al (2001) Colbert and Heller(2001) Awe (2006) and Majekodunmi (2008) indicate that job satisfaction is positively correlated with motivation, involvement, organizational citizenship behavior, organizational commitment, life satisfaction, mental health, and performance, and negatively related to absenteeism, turnover, and perceived stress. Smith, Kendall, and Hulin (1989) considered five facets of job satisfaction: pay, promotions, co-workers, supervision, and the work itself. Spector (1995) assessed nine facets: pay, promotion, supervision, fringe benefits, contingent rewards, operating conditions, co-workers, nature of work, and communication. Job satisfaction can also be seen within the broader context of the range of issues which affect an individual's experience of work, or their quality of working life. It can be understood in terms of its relationships with other key factors, such as general well-being, stress at work, control at work, home-work interface, and working conditions.

Many theories have been proposed concerning the causes of workers’ job satisfaction. Judge et al (2001) classifies them into three categories: situational theories, dispositional approaches, and interactive theories. Situational theories assume that satisfaction results from the nature of one’s job or other aspects of the environment; examples are Herzberg's (1967) two-factor theory, the social information processing approach, and the characteristics model. Dispositional approaches suggest that satisfaction is rooted in the personal make-up of the individual. Interactive theories propose that satisfaction results from the interplay of the situation and personality; examples are the Cornell integrative model and the value percept theory. Although one can assume that these theories are competing or incompatible explanations of satisfaction, Judge et al. (2001) suggests that some may be compatible with each other.

One of the biggest preludes to the study of job satisfaction was the Hawthorne studies. These studies (1924-1933), primarily credited to Elton Mayo of the Harvard Business School, sought to find the effects of various conditions (most notably illumination) on workers’ productivity. These studies ultimately showed that novel changes in work conditions temporarily increase productivity (called the Hawthorne Effect). It was later found that this increase resulted, not from the new conditions, but from the knowledge of being observed. These
findings provided strong evidence that people work for purposes other than pay, which paved the way for researchers to investigate other factors in job satisfaction.

**Gender Equality as a Panacea for Job Satisfaction**

The relationship between workers job satisfaction and gender has been examined frequently. However, the results of many of the studies have been contradictory. Some studies have shown females to be more satisfied than men whereas other studies have shown men to be more satisfied than female. Ogundele (2005) observes however, that most of the researches in this area report no significant differences between the sexes in relation to satisfaction. Kim and Cho (2003) affirm that satisfaction with work is the most influential determinant of the quality of life among government workers in Korea. As regards to what males and females look for in a job, the evidence is also inconsistent. Intrinsic and extrinsic work orientations represent work-related preferences to value specific types of rewards inherent in the work environment. Individuals high in intrinsic orientation value opportunities for satisfaction with the work itself, feelings of self-determination and competence, and personal development, whereas individuals high in extrinsic orientations primarily value financial compensation, promotion, and prestige. Some studies show that females value extrinsic characteristics more than do men, and some show the opposite. Yet others have found no differences between men and female in terms of intrinsic and extrinsic work orientations. According to Mottaz (1986) at lower work levels males focus on intrinsic and extrinsic rewards and have more intrinsic work-related values, whereas females emphasize social rewards and more relationship-oriented work-related values. However, at managerial levels, males and females tend to view their jobs as being equally rewarding and have similar work-related values.

Kim, (2005) examined gender equality in orientation to work, using closely comparable data collected in nine Western European countries. The results show that males place greater value than females on both extrinsic and intrinsic work values and are somewhat more satisfied than females with their jobs. A central paradox in studies of gender and job satisfaction is why female’s satisfaction is not lower than men's, given that female's s are often inferior in terms of pay, autonomy, and promotional opportunity. Sousa-Poza and Sosa-Poza (2000) shows that in most countries females are actually less satisfied than men, whereas in the Great Britain and the United States females had much higher satisfaction levels than men among the 21 countries employed for the study. Kim (2005) thus suggests that the gender/satisfaction paradox is not a worldwide but may be an Anglo-Saxon phenomenon. Khaleque and Rahman (1987) found that there were significant differences between some demographic variables (age, experience, social status) and workers satisfaction in Bangladesh. Older workers and married females were more satisfied with their jobs than other workers were.

3. **METHODOLOGY**

The study uses a descriptive survey research design. The target population consists of all staffs that are in Epe Local government education authority. There are male as well as female staff at the Epe LGEA. The sample consists of 30 males and 30 females staff. Purposive random sampling technique was used in selecting the respondents putting sex into consideration. The instrument used was self-constructed questionnaire. The questionnaire consists of two sections. Section A dealt with bio data of the respondents, while section B consists of items that focused on gender equality as a panacea for job satisfaction in Epe LGEA for the respondents. The experts validated the instrument and the reliability was tested by Cronbach Alpha reliability test. Cronbach Alpha co-efficient obtained for the instrument was considered well enough for the instrument to be used. The data collected were analyzed using t – testing at 0.05 level of significant. The below hypotheses were statistically analyzed.

**Hypothesis One:**

\( H_0: \) There is no significant difference between gender equality and job satisfaction in Epe Local Government Education Authority, Lagos State.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Standard-Deviation</th>
<th>T-cal</th>
<th>df</th>
<th>T-table</th>
<th>decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender Equality</td>
<td>799</td>
<td>32.852</td>
<td>5.348</td>
<td>11.570</td>
<td></td>
<td>1.96</td>
<td>Rejected</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>230</td>
<td>11.852</td>
<td>13.134</td>
<td>0.05</td>
<td>1027</td>
<td>1.96</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 above shows a calculated t- value for 11.570, testing at an alpha level of 0.05, and the table value 1.96. Thus, the calculated t-value 11.570 was greater than the table t-value 1.96. Therefore, the hypothesis which
states that, there is no significant difference between gender equality and job satisfaction in Epe local government education authority was rejected.

**Hypothesis Two**

**H02:** There is no significant difference between male and female staff job satisfaction in Epe Local Government Education Authority, Lagos State.

**Table 2:** Two sample t-test on gender difference of the job performance level of Staff

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Standard-Deviation</th>
<th>T-cal</th>
<th>SF</th>
<th>Df</th>
<th>T-table</th>
<th>decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Worker</td>
<td>10.752</td>
<td>3.725</td>
<td></td>
<td>1.100</td>
<td></td>
<td>0.05</td>
<td>1027</td>
<td>1.96</td>
</tr>
<tr>
<td>Female Worker</td>
<td>11.611</td>
<td>5.018</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 above shows a calculated t-value for 1.100, testing at an alpha level of 0.05, and the table value 1.96. Thus, the calculated t-value 1.100 was less than the table t-value 1.96. Therefore, the hypothesis which states that, there is no significant difference between male and female staff job satisfaction was accepted.

4. **DISCUSSION**

The result shows that female staffs have job satisfaction than male staff. Adeyemi (2004) obsolete reference observed that women in educational agencies stick to their jobs much more than their counterparts who generally tend to go for greener pastures. It seems males prefer jobs that will fetch them more income. Consistent with previous studies, quantitative measures showed no statistically significant differences in the job satisfaction of male and female employees in Epe LGEA of Lagos State. However, the qualitative findings revealed differences in the discourses these men and women used to describe their perceptions and attitudes. The male respondents were more likely to use language that evoked professional efficacy, a sense that one could act upon the work environment in various ways. The female respondents more likely to use language that related to production and suggested a less secure position in the workplace. The significant discrepancy between the salaries of men and women in this group accentuated this difference.

5. **CONCLUSION AND RECOMMENDATION**

5.1 Conclusion

It is important to note the findings of this study are not generalizable, due to its small sample size. In addition, the quantitative measures did not include an item that specifically addressed salary—an oversight that should be corrected in future research. However, the qualitative findings contain insights for researchers. Organizational support emerged as an area that offered the most opportunity for employers to influence the job satisfaction of women and men. As feminist theory teaches, gender functions to create different experiences for male and female employees. Employers who are mindful of this are more likely to create an environment that is supportive of both. As a group, women would clearly benefit from higher salaries. Overall, this study makes an important contribution to the literature, showing that men and women are more similar in the factors that affect their job satisfaction than one might think. This study shows that men and women differ in race, part-time work status, income, and number of children, but are similar in the effects of age, marital status, occupational prestige, job tenure, job autonomy, job security, and social support.

5.2 Recommendations

In order to promote gender equality in employment in our higher institutions and other establishments whether public or private, advocacy by government and non-governmental organizations should include sensitizing the people to understand that both men and women are partners in the developmental process. To achieve this purpose, government should integrate the media in mass enlighten campaigns on the need to promote gender balance in employment opportunity.

Gender balance in education is not only a matter of social justice but also of good economics. Gender disparity in education lowers the potential well-being of the society given that education has direct effects on human development.
The women should avail themselves any slightest opportunity offered by their parents, guardians, husbands and government to explore economic empowerment as it can provide improvement for their family members and the society at large.

The state should endeavor to past the bill to domesticated CEDAW and work hard to ensure that all forms of discrimination against women and girls are reduced to the barest minimum.

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WOMEN IN SURVEYING

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ABSTRACT

“Surveying the bedrock of every meaningful development” says the motto of the surveying profession reveals the relevance of the profession in all spheres of meaningful development and growth. Though, it is known for rigor, accuracy and precision but its contribution to industrialization cannot be over emphasized. This paper therefore necessitates generally the hallucination of women in surveying to bring about more essential and adaptive changes in industrialization within the scope of the mission, vision and goal of the surveying profession. Also, the importance of surveying and the role of surveyors in industrialization were discussed. The topic women in surveying entails the role of women in surveying in moving the economy, thus helping in social and economic growth, the challenges of female surveyor in Nigeria and how women can be encouraged to participate in industrialization were discoursed. Summary was drawn and recommendation was made on how the topic can successfully and resourcefully transform our society Nigeria for better.

Keywords: Surveying, Women, Industrialization, Nigeria

1. INTRODUCTION

Surveying is the art of measuring horizontal and vertical distances between objects, of measuring angles between lines, of determining the direction of lines, and of establishing points by predetermined angular and linear measurements.

Land surveying is basically an art and science of mapping and measuring land. The entire scope of profession is wide; it actually boils down to calculate where the land boundaries are situated. This is very important as without this service, there would not have been railroads, skyscrapers could not have been erected and neither any individual could have put fences around their yards for not intruding others land.

Land surveying isn’t exactly a new industry, but it is a new age where women are making their mark. As long as there has been property to divide, people, specifically men, were needed to set proper boundaries that people and governments recognized. Then in the early 1900s, women made their first official move into the industry. Progress has been slow, but they’ve never looked back. There’s nothing about land surveying that poses a greater challenge for women than men, at least not aside from outdated ideas and traditions. Men still dominate the industry, but that gives women one more opportunity to break through an unnecessary barrier and build a profitable, rewarding career. (Academy, 2017).

A Surveyor is a professional person with the academic qualification and technical expertise to practice the science of measurement; assemble and assess geographically related information; use that information for the purpose of planning and implementing efficient administration of the land, the sea and structures thereon; and instigate the advancement and development of such practices (Asoegwu, 1996, Kufoniyi, 1997).

Magel (2005) observed that “Surveyors should play a visible role in the society and that they should also be actively involved in the provision of reliable data for planning, contributing meaningfully to urban and rural development, valuation and real estate management and environmental decision making. Much cannot be achieved in this regard if the women surveyors are neglected or relegated to the background. This responsibility placed on Surveyors to ensure that the environment is ordered is a holistic one. Thus, there is need to harness the enviable contributions of women in surveying because Women Surveyors by their nature are “enablers for the local people and the less privileged”, mediators between citizens and authorities and Advisors to politicians and state institutions”; they are very compassionate in their professional practice. A nation cannot have any meaningful development without adequate and up-to-date Geo information. This is evident in engineering constructions and civil works (new roads, bridges and high rising buildings), location based services like communication lines, power, and steel, sewage lines etc. Before any
meaningful or sustainable development is achieved the Surveyor or the Geospatial expert must provide the pertinent information or baseline data for engineering designs and subsequent construction works. Women Surveyors have the track record of being amongst the industry’s best as they are not known in any way to compromise standards and best practices. (CHIGBU Jennifer Eziaku, 2013).

2. **THE ROLE OF SURVEYORS IN INDUSTRIALIZATION**

1. Surveyors are responsible for the production of small and large scale maps as well as survey plans to enable the planner to design layouts, roads and locations of infrastructures. Hence the surveyors have invaluable input in the acquisition of foundation data which have varied uses in terms of development in rural and urban areas.

2. Roads are very critical to development and surveyors need to set out roads to enable the highways engineer design and construct them, other infrastructures such as electricity, pipe borne water, and sewer lines need alignment or level to be set out based on given or required specification.

3. Surveyors Provides the “Title Deed Plan’s” (TDP) which is used for customary statutory right of occupancy, (this is a right of ownership established on custom rather than common law or statute i.e. customary occupancy which is still very much prevalent, the distribution of rights which is based on socio-political system, the political history or the village and region from which the alliances and hierarchical relationships between lineages and derived, and on family relationships (access to land and resources depending on one’s social status within the family) so that social networks govern access right (Berry, 1993, Umezulike, 2004) is also, worth noting that in most of this decisions about land are taken by chief or headmen on behalf of the and in trust for the clan or family). Large scale plans are fundamental to development and planning of educational facilities, health, recreational and security etc.

4. Housing – Surveyor need to provide maps and data input for GIS various settlement which would aid the government in providing materials for regularization of titles, ensure guidance on the location of health and educational facilities as well as the location of police stations.

3. **WOMEN IN SURVEYING**

The Nigeria Institution of Surveyor’s which was established in 1934, was one of the oldest organized professional Bodies in Nigeria. The Institution was initially as “Licensed Surveyors Association” which was later renamed the “Land Surveyors Association of Nigeria” with the late Surv. C. T. Olumide as chairman, whose memories is now engraved in an annual lecture tagged “OLUMIDE MEMORIAL LECTURE”. In 1966, the present name “Nigerian Institution of Surveyors” was adopted. The Nigerian Institution of Surveyors is the umbrella professional organization for all surveyors in Nigeria, whether in private practice, Government or Academia.

Women in surveying (WIS) is the women arm of the Nigerian Institution of Surveyors. Women-in-Surveying in Nigeria as a professional body started about ten years ago under the leadership of Surv F.K. Omatsola (Fnis) and the membership of this Association currently is about two hundred and fifty. The essence of this feminist gender arm of Nigerian Institution of Surveyors borders on the pursuance and achieving of the objectives of MGDs. Surveying particularly had for decades been monopolized by the men but today the story is quite different, despite the challenges faced by women in surveying profession, the hardworking and committed female Surveyors have made landmark achievements for example, the first woman Surveyor General of the Federal Republic of Nigeria was Late Mrs. Yinka Adekoya known as “SUPER GIRL”. In Lagos state of Nigerian the first female surveyor to become permanent secretary was Alhaja I.O Fassai. These women have contributed in no small measure in the upliftment of professionalism during their reign. (CHIGBU Jennifer Eziaku, 2013).

It will not be out of place to mention some of them that has got to the pinnacle of the professions, which among many include.

- The zonal surveyor, Yebu-Ode Surv. (Mrs.) A.O Aseyokunnu Surv. (Ms.) Remi Akinlude.
- The former Surveyor General of Lagos State who is the first female surveyor to become permanent secretary in Lagos State, Surv. (Alhaja) I.O Fassai.
- Surv. (Mrs.) J.O Asenuga, Coordinator women in Surveying Wealth Region.
- Surv. (Mrs.) S.O Adekunle, principle partner of S.O Adekunle and Associates.
- Surv. (Mrs.) A.S Abiba principal partner of final points surveys.

*1st National Conference of WITED, Ilaro Chapter*
Women in surveying have heads prominent Departments in the Countries and some are distinguished lectures in our Universities today.

The Role of Women in Surveying

Mostly since surveying takes leads in all developments, planners from different areas, government, individuals that want to start one project or the other area always waiting for the surveyors to take the project to the next level. Therefore, many people are depending on the result of surveyors for progress in their projects, it is of paramount importance for her to be of high integrity.

Looking at the high technical demand and stress involved in surveying, it takes a winning woman not to quit but to strive hard in order to acquire data for development For a woman a gentle feminine touch and humble spirit will give her an edge. At times, as a woman, your job will take you to a cultural environment where women are not allowed to hold meeting with men, talk more of talking in their midst, but with your professional privilege you will be allowed, and in such places, you need wisdom, humility and favor to succeed because it’s a great disrespect of culture to many. Also there places where a male surveyor cannot enter due to the volatile nature of the job. As a female surveyor in Nigeria, you can go in there and execute the job successfully with results. The reason is that most of them had never seen a female surveyor, more so when they think that it is not a woman’s profession. Also most men abhor manhandling women or ruffle them, so in the midst of scuffle, they will treat them with care.

Women naturally are peace makers and so women in surveying are great peacemakers in volatile land disputes cases, so also, women are natural communities relation experts in off shore environment, they are conscious of safety in performing their duties, no wonder Surv. (Mrs.) Elizabeth Oluwadara Olayiwola won an award in safety issue in Geomatics Department of Shell Petroleum Development Company Limited (SPDC) west in the year 2000. Also management of caterers offshore is best left to the female surveyors who will co-ordinate it in a hygiene and safe way. In Nigeria women ninety percent believe is that women place is in the kitchen meaning that women are best caterers. It is well known that a feminine touch in every vocation brings a perfection that is absent in all male crew, it refines and sanitizes the group. (Benedicta UGWULEBO, 2010)

Women Surveyors are actively involved in the provision of geospatial data required for planning and execution of associated projects for sustainable development. They are known also to have contributed in providing environmental data that aids in reduction of environmental vulnerability hazards such as natural disaster, desertification, flooding, collapse of houses and bridges.

Women in surveying like their male counterparts also have contributed in the production of large scale plans which are fundamental datasets for development and planning of educational facilities, health, recreational and security etc.

In terms of housing, their roles cannot be underestimated. Most female Surveyors are GIS experts and their professional inputs have aided the government in the provision of materials for title regularization, ensuring guidance on the location of health and educational facilities as well as the location of police stations and other infrastructures.

For a Nation to have sustainable roads, Surveyor needs to set out roads, provide their height and other necessary information that will enable the Highway Engineer to design and construct good roads. A good number of women Surveyors are actively involved in this sector.

There is need to integrate the Women in Surveying in Nigeria into all facets of the geospatial data provision for use in development of the spatial data infrastructure policy of Nigeria for sustainable development.

The women in surveying are advocacy tools for promoting and encouraging more young women to choose scientific careers, combating gender inequality and helping in the realization of the goals of the Millennium Development Goals (MDGS) and sustainable national development. (CHIGBU Jennifer Eziaku, 2013)
4. CHALLENGES OF FEMALE SURVEYOR IN NIGERIA

Women in Nigeria have had various challenges in order to obtain equal education in all forms of formal education in Nigeria. Education is a basic human right and has been recognized as such since the 1948 adoption of the universal declaration on human rights. A positive correlation exists between the enrollment of girls in primary school and the gross national product and increase of life expectancy. Because of this correlation, enrollment in schools represents the largest component of the investment in human capital in any society. Rapid socio-economic development of a nation has been observed to depend on the caliber of women and their education in that country. Education bestows on women a disposition for a lifelong acquisition of knowledge, values, attitudes, competence and skills. To ensure equal access to education, the national policy on education states that access to education is a right for all Nigerian children regardless of gender, religion and disability. (Dauda, 2007)

Nevertheless, it is abundantly clear that in some area in Nigerian, that before the Nigerian female attains a level in education commensurate with their more than half the population status, mountains will literally have to move. Women in surveying face the challenges of male ego from subordinates, superiors and even colleagues who mostly that woman should be in the kitchen or at best are in classrooms. When it comes to fieldwork such as the survey camp, where mountains have to be climbed, creeks to be crossed, offshore projects to be carried out women are looked down upon as though in capable, but look at it this way, fieldwork and frail women, what a marvelous mix? Women in surveying maybe frail but their stamina and strength are remarkable enduring.

As a woman in surveying the changes start from the training, in a course of study. A woman in surveying in the making must learn are earn how to have sharp mind and brain for qualitative reasoning because every measurement and calculation must be accurate to achieve reliable results that is presentable worldwide. Training is not only the study in the lecture room, library and laboratory which are conducive environment, but in rigorous fieldwork that will take you to different terrains such as on land, on rock, in swamp, in space and on water as may be required, in most cases; you are exposed to harsh weather conditions. Also there are sacred bush in some places that are refer to as “no-go area” female surveyors must have good human relation as a preparation for challenges on her job after training, this will help her to undertake and type of project that may come her way and make her an achiever. It is after favorable academic institution result, she will face the challenges of preparation for professional qualifications, and studying under her supervisor for two years or more followed by examinations that will qualify her professionally. A woman in surveying must be very hard working and of great commitment, she must have and enduring spirit because clients want their job delivered as early as possible. (Benedicta UGWULEBO, 2010).

Evidently, in Nigeria, the Survey council of Nigeria (SURCON) which is the body legally empowered to regulate the practice of the surveying profession activities in the country in all ramifications has a Council made of 59 members, as follows:

- The President of the Council, who is appointed by the President of the Federal Republic of Nigeria,
- 36 Surveyors General of the States,
- The Director of Survey & Mapping, FCT,
- 12 Representatives elected by the Nigerian Institution of Surveyors,
- 5 Representatives of the Federal Government including the Surveyor General of the Federation and
- 4 Representatives of Institutions of higher learning offering Surveying & Geo-informatics.

However, only two women are in this council of fifty-nine members (59). In this council there is no way they can make a positive impact in policy and decision making level in this council.

Again, the Nigerian Institution of Surveyors (NIS), on whose auspices this global gathering is made today has a council which is the highest decision making body. The council is composed of the elected Executives Officers, representative of State Branches, Women-in-Surveying, the Academia, Association of Private Practicing Surveyors (APPSN) and other recognized sub-group. Ironically, the council has less than three (3) women in their fold. The representation of women in Nigerian Institution of Surveyors (NIS) council and the Survey council of Nigeria (SURCON)show that the professional body and the regulatory body are not gender sensitive.
Therefore, the contribution of women toward the overall development of the country will be minimal. This is inimical to the global objective of female integration to sustainable development. Women by their nature have varied preferences from men in choosing their academic field, and the pattern is similar in developing countries like Nigeria and most industrialized countries. Women are more likely to enroll in humanities, arts and education, with social sciences the next preference, while natural science and engineering is the least favored field. (CHIGBU Jennifer Eziaku, 2013).

Encouraging Women Participation in Industrialization

The rate at which women are excluded from formal and traditional policy and decision making roles regarding industrialization and development is large, however, in various ways where they have been involved they have immensely contributed their quota in matters that pertains to industrialization, therefore, it is essential to observe that granting women the privilege of equitable role in industrialization decision making would yield rapid and commitment to the solution of developmental challenges rather than seeing them as irrelevant and weaker entity. Women must be seen as capable partners in sustainable development, and not simply as victims of environmental degradation or even solely as beneficiaries of development initiatives. The strength of women in making decision on industrial development and its management cannot be overemphasized because of God’s endowed potential in them. For women to respond to economic growth or social change, they should have access to available resources, financial credits, information and technical assistance.

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Due to limited involvement and participation of women in the body legally empowered to regulate the practice of surveying activities in the country, there is therefore, the need for corresponding change in the Nigeria surveyor’s world view and proactive, success will depend on the ability of our surveyors to transform them.

5.2 Recommendation

Having critically considered the desirable roles women have played in surveying, the following suggestions are hereby proffered:

Women of vision, who are able to set long term goals, develop strategies to bring about more fundamental and adaptive changes are needed at the top.

There is need for the regulating body SURCON (surveyors registration council of Nigeria) and NIS (Nigeria institution of surveyors) to re-orient the value system of members (males) towards the female gender and her contribution to the profession.

Women who have made meaningful contributions to the profession like their male counterparts should be celebrated and immortalized. This will elicit more meaningful and sustainable contributions from the female surveyors.

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