ABSTRACT

This paper analysed female participation in learning and use of software packages in Nigeria, using a case of SAP ERP Software in University of Ibadan, Nigeria. Data on all 618 participants (male and female) from 2015-2017 in the University of Ibadan were obtained through structured questionnaire and analysed using descriptive statistics (frequency counts and percentages) and Likert rating scale. Results show that 143 (23.1%) of the participants were female from different course backgrounds. Over the years, female participants had more than 80% success rate and an overall success rate of 86% which was higher than 81.6% success rate for all the participants and 80.2% success rate for male participants. The Likert analysis shows that the expectations of the female participants were significantly high and majority were involved in the learning and use of SAP ERP to have competitive advantage (4.7/5), diverse job responsibilities (4.3/5) and higher positions in job place (4.2/5). The major constraints to acquiring the skill were high cost of infrastructure and the payment for training and examination to qualify for proficiency certificate. They also wanted more female-friendly approaches to learning. Greater female proficiency in software handling will enhance productivity and growth for economic development.

Keywords: Business processes, ESEFA, Female participation, SAP ERP software, University of Ibadan

1.0 INTRODUCTION

The role of information technology education development in Africa, most especially sub-Saharan countries cannot be overemphasized. Against the backdrop of unavailability and/or shortage of Enterprise Resource Planning (ERP) systems in Africa, the Enterprise System Education for Africa (ESEFA) initiative seeks to address the shortage of Enterprise System skill in Africa by enabling local universities produce highly qualified ICT and ERP professionals through high quality enterprise system education programme in partner universities. This is with a view to contributing to increase in Africa’s competitiveness, productivity and growth which are the backbone of economic development.
In recent times, the subject of women emancipation and inclusivity is fast becoming relevant with deep concerns around the backwardness that has bedevilled dispensations that witnessed little or no influence of their contributions to socioeconomic and technological advancement. Quite a diverse of impeding barriers to growth and productivity are gradually receding with special attention to gender possibilities arousing global interest. The emergence of feminism and its strong rebuttal against gender imbalance is indeed a consolation for its achievements thus far. This was the argument by Stamp (1989), who portends that the greatest achievement of feminism is entrenched in the emerging moral and scientific commitment to the truth that women constitute half of humanity and that gender relations are as principal to staging a voice in society as economic relations or political structure.

Men and women hold perfectly unequal access to resources and insightfully, there is no perfect economy in the world that is gender neutral. Hence, in development discourse, women retain a meagre slot for inclusion, even if they get far from equal chance (Taefnout and Timjerdinge, 2005). The interaction between gender relation and technological transfer is critical to development in the political economy. According to Stamp (1989), the problem regarding technology and gender in Africa is not a lack of knowledge, but the fact that the knowledge is fragmented. Scholars researching the interplay between women and technology and its impact on development have identified a common set of problems throughout the third world countries. This is evident in the complications around sex-gender systems and historical experience.

According to Stamp (1989), over the millennia, agriculture, health and nutrition are largely the responsibility of African women. They have found themselves with characteristic increased workloads, a more subordinate position within the family, attenuated communal life with other women, and lost rights to resources. For example, women devoted approximately 4.7 times more time in Madagascar, and nearly 3 times more in South Africa and Benin, to domestic and care activities (Blackden and Wodon, 2006). As a result, successful technological transfers in these fields aimed at empowering and strengthening their community involvement are far too more than often the reverse, with profoundly negative consequences.

Although, recent development has witnessed significant bridge in the nexus between gender relations and promising potentials in technological advancement, most of the studies in recent years on women’s access to and usage of Information Communication Technologies argue that there is a significant gender divide in ICT access and usage, particularly in developing countries. Studies also revealed uneven nature of the benefits that accrue to men and women from social engagement and economic participation, particularly to those living in remote rural areas in developing countries (Mottin-Sylla, 2005). According to them, a study carried out in 2005 by the Gender and ICT Network, reveals that, globally, women’s chances to benefit from the advantages of the information society are one third less than men’s.

The quest for understanding gender similarities and differences in technological access and usage had been on the increase. Gender and technology studies have found that men and women adopt and use technology differently (Venkatesh and Morris, 2000; Gefen and Straub, 1997). Venkatesh and Morris (2000) argued that men’s decisions to use technology are more strongly influenced by their perception of usefulness, while women’s decisions are based more on perceptions of the technology’s ease of use. United Nations Women (2016), reported that in the turn of the 21st century, there has been laudable gender response to Science, Technology, Engineering and Mathematics (STEM) among Africa women. Statistics has it that, over 68% of south African women at tertiary institutions have enrolled in an ICT related courses in the
last few years, also, 23% of the 56% of women in professional technology jobs globally are from South Africa.

This technological drive has brought about some of the incredible technology solutions and projects created and led by African women which include: AJAL.A Studios, a Nigerian software company that builds natural language processing applications for African languages, allowing people to interact with devices and digital services in their local languages. Afros Games, based in Kenya and South Africa, builds gamified learning solutions aimed at engaging youth across the continent. Mfarm, a mobile software solution that provides Kenyan farmers with produce prices and connects them directly to consumers through a virtual market place. Mechanic policemen, a robot that record traffic behaviours, and transmit footage to the police in Kinshasha, DR Congo. Imed Tech is a South African medical prosthesis design, using 3D technology to create custom-designed breast forms for people who have undergone mastectomies, and other brilliant technologies developed by African women.

The Abocoders initiative teaches software development to women and girls in northern Nigeria. Kenyan organization, AkiraChix, which was started in 2010 runs programmes for disadvantaged girls, exposes high school learners to career opportunities in technology. Azikana Network in Zambia works to increase women’s participation in technology by providing training, mentorship and networking opportunities. Cape Town based Code4CT has since 2014 trained 127 high school girls in development and data science. GirlHype has been teaching programming and application development to girls and young women in South Africa for 12 years. The accomplishments of these women are impressive and inspirational. Divine Ndhlukula is the founder of Securio, an industry leader in providing custom guard services and cutting-edge electronic security solutions based in Harare, Zimbabwe. Julia Rotich is one of the founders of Ushahidi, a Nairobi-based tech company that specializes in developing free and open source software. Mariéme Jamme, a social entrepreneur and technologist, co-founded Africa Gathering, the first global platform where entrepreneurs and experts meet and share ideas about development in Africa (Chisanga, 2017). Geek Girls Initiative in the University of Ibadan, Nigeria where girls are trained in software use for web design has trained secondary school girls in recent years.

According to Magal and Word (2012), as more and more businesses around the world adopt enterprise systems, it becomes increasingly important for students to develop a more process-centric perspective that reflects the realities of the modern business environment in which they will work. Therefore, ES education presents methods of restructuring business curricula in order to use Enterprise System solutions. Enterprise Systems Education is based on learning to use SAP ERP software packages to integrate and solve problems in business processes such as: procurement, sales, asset management, project management, accounting, inventory management, and etcetera. ES courses are significant supplement to business and Information Technology study programmes at universities.

The University of Ibadan (UI) is one of the thirteen partner universities in Africa for the delivery of ESEFA Enterprise Systems (ES) curriculum. This followed the approval and signing of a 3-year partnership contract by the Vice Chancellor on behalf of University of Ibadan with the Otto-von-Guericke University, Magdeburg (OVGU), Germany, in 2014. Although the ESEFA initiative at UI is being coordinated by the Department of Industrial and Production Engineering (IPE), it involves the integration of ES curriculum into selected courses in the participating Departments: Industrial and Production Engineering, Agricultural Economics and Computer Science, as well as into courses at the UI Business School. Also,
there are regular SAP ERP short courses for interested students (male and female) of the university to obtain proficiency certificate. In addition to this, SAP Certified Application Associate-Business Process Integration with SAP ERP 6.0 (called TERP 10) commenced in UI in 2017.

Mbambo-Thata (2009) show that female students’ limited engagement relative to their male counterparts was not a result of timidity or technophobia. Women students, they argue, “did not lack confidence in their capacities”, but were constrained by using them in male-dominated institutional spaces and cultures and benefited enormously from female-friendly approaches. Hence, Gillwald et al. (2010) suggest that harnessing the entirety of human capital, from both men and women alike, is the headway to meeting developmental needs of countries, operate a modern economy and society effectively, and ensuring competitiveness in the global economy. Technology is a critical driver of women’s economic empowerment. This is reflected in a range of initiatives that seek to enhance women’s use of technology for income generation and solution development. Africa’s encouragement of women to pursue education and careers in the science and technology sector is widely acknowledged. Innovation in science and technology are key factors in achieving growth, and women need to be included. Many women and men have come to realize that empowering women through technology and education will transform countries.

With respect to the female participation in learning and use of software, this paper seeks to answer the following questions:
i. What is the level of female participation in learning and use of SAP ERP Software?

ii. What is the level of success of female participants in learning and use of SAP ERP Software?

iii. What are the expectations of the female participants on acquiring the skill?

iv. What are the constraints the female participants face in acquiring the skill?

In order to answer the questions, the objectives of this paper are to examine:
i. The level of female participation and success in learning and use of SAP ERP Software

ii. The expectations of the female participants on acquiring the skills

iii. The constraints that female participants face in acquiring the skills

**Definition of Terms**

ERP – Enterprise Resource Planning
ES – Enterprise Systems
ESEFA- Enterprise Systems for Africa
SAP – Systems Application Products
UI – University of Ibadan

**2.0 METHODOLOGY**

This paper focused on female participants in learning and use of SAP ERP software in the University of Ibadan, Nigeria. The University of Ibadan is the oldest University in Nigeria. It is located in Ibadan, which is the capital city of Oyo State. Ibadan is a major central city in the southwestern Nigeria. The three participating Departments include Industrial and Production Engineering in the Faculty of Technology, Computer Science in the Faculty of Science and Agricultural Economics in the Faculty of Agriculture.

Primary and secondary data were used (2015-2017). Secondary data on 618 participants (male and female) were collected from the Department of Industrial and Production Engineering which is the supervising department for ESEFA activities in the University of Ibadan. These
activities include; creating awareness among students, registration and scheduling of training for students, and scheduling of proficiency examination.

From 2015 to 2017, 143 female participants were identified and interviewed using structured questionnaire to generate cross sectional primary data on the participation and success of female participants in learning and use of SAP ERP Software, the perception of the female participants on acquiring the skills and the constraints faced in the process. Data were analysed using descriptive statistics and the Likert rating scale. The Descriptive statistics were used to analyse female participation in the learning and use of SAP ERP software, and the constraints they face in participating in the learning activities. The descriptive statistics include frequency counts and percentages, and the results are presented in frequency distribution tables.

**Likert rating scale**

Likert rating scale was used to assess the expectations of the female participants. The 5-point rating scale was graded as:

- Strongly disagreed = 1
- Disagreed = 2
- Undecided = 3
- Agreed = 4
- Strongly agreed = 5

The mean score of the responses based on the 5-point rating scale were given as:

\[
5 + 4 + 3 + 2 + 1 = 15/5 = 3
\]

Based on this scale,

- Mean score < 3, responses are insignificant
- Mean score = 3, undecided
- Mean score > 3, responses are significant.

Significant mean scores (>3) indicate that agreement of the female participants to the statement shows high level of expectation.

### 3.0 RESULTS AND DISCUSSIONS

#### 3.1 Level of Female Participation and Success in Learning and Use of SAP ERP Software

The level of female participation and success in learning and use of SAP ERP Software is presented in Table 1. There were 618 participants (male and female) from 2015 to 2017. There were more participants in the year 2015 and 2016 because trainings and exams were free as integrated courses in the 3 Departments, although participants procured the training manuals and internet facility since the use of the software is online. In 2017, participants started paying exam fee to qualify for the proficiency certificate. This is mainly responsible for the reduction in the number of participants.

Results show that over the years, female participants were less than one-quarter (23.1%), although in 2016, they were just a little above one-quarter (25.9%). This shows the dominance of male participation in learning and use of the SAP ERP software. Out of 618 participants, 504 were successful, indicating a general success rate of 81.6%. UI had the highest success rate during the 2014 – 2016 project era among the partner universities. Out of the 143 female participants, 123 were successful, indicating a success rate of 86%. This is corroborated by the fact that female participants, over the years, had higher success rate (83.6% - 88.2%) than the general success rate (81.6%) and the male participants’ success rate (80.2%). Although the ratio of successful female participants to the total number of successful participants was less...
than a quarter (24.4%), the female participants had higher level of success in the use of the SAP ERP software.

Table 1: Level of Female Participation and Success in Learning and Use of SAP ERP Software

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of participants (A)</th>
<th>Female participation (B)</th>
<th>Number of successful female participants (C)</th>
<th>Success rate (C/B) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>244</td>
<td>48</td>
<td>42</td>
<td>87.5</td>
</tr>
<tr>
<td>2016</td>
<td>204</td>
<td>61</td>
<td>51</td>
<td>83.6</td>
</tr>
<tr>
<td>2017</td>
<td>170</td>
<td>34</td>
<td>30</td>
<td>88.2</td>
</tr>
<tr>
<td>Total</td>
<td>618</td>
<td>143</td>
<td>123</td>
<td>86.0</td>
</tr>
</tbody>
</table>

General participation
Total number of successful participants = 504
General Success Rate (504/618) = 81.6%

Male Participation
Total number of male participants = 475
Proportion of successful male to total successful participants (123/504) = 75.6%
Total number of successful male participants = 381
Male participants success rate = 381/475 = 80.2%

Female participation
Total number of successful female participants = 123
Proportion of successful female to total successful participants (123/504) = 24.4%
Female participants success rate = 86.0%

Source: Data Analysis, 2018

3.2 Expectations of Female Participants on Acquiring SAP ERP Software Skill

Findings on the factors that motivate the female participants are presented in Table 2. Majority of the participants (88.8%) were motivated by their general interest in enterprise systems education, knowing that it exposes them to the use of the software in integrating business processes and solving business problems. Nevertheless, some (14.0%) of the young women were compelled to learn it because it was an integrated part of a required class in the Departments of Industrial and Production Engineering, Computer Science and Agricultural Economics (Agribusiness). However, high proportions, 83.9% and 83.2% of the female participants were motivated by the use of the software and obtaining the SAP proficiency certificate, respectively. Being certified on the SAP ERP software adds value to their degree certificates and makes them relevant in the technology and business world like their male counterparts. Specific application knowledge of SAP ERP software is highly relevant in all fields of business activities of the most diverse enterprises.

The findings on the expectations of the female participants on acquiring the SAP ERP skill are presented in Table 3. The responses of the female participants on the statements of their expectations were all significant with likert mean score greater than 4.0. However, the highest mean score was obtained on the expectation of the young women to have competitive advantage over others. Enterprise systems education enhances their marketability and prepare them for project and management positions in complex working environments. Also, the female participants significantly agreed that they will have higher entry level positions, more diverse job opportunities and higher entry level salaries in the work place. The handling of software for business will enable them to become very relevant in the business world. Enterprise systems qualified personnel are in high demand and are particularly sought after by
organisations. Ability of young women to understand and work with these software applications is a major advantage for them in the job or labour market.

Table 2: Motivations of Female Participants in Learning and Use of SAP ERP Software

<table>
<thead>
<tr>
<th>Reason for taking part in learning SAP ERP Software</th>
<th>No of participants n = 143</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>General interest in ES Education</td>
<td>127</td>
<td>88.8</td>
</tr>
<tr>
<td>Integrated part of a required class</td>
<td>20</td>
<td>14.0</td>
</tr>
<tr>
<td>Use of SAP software</td>
<td>120</td>
<td>83.9</td>
</tr>
<tr>
<td>SAP Proficiency Certificate</td>
<td>119</td>
<td>83.2</td>
</tr>
</tbody>
</table>

Source: Data Analysis, 2018

Table 3: Expectations of Female Participants on Acquiring SAP ERP Software Skill

<table>
<thead>
<tr>
<th>Expectation from Use of SAP ERP Software n=143</th>
<th>SD</th>
<th>D</th>
<th>U</th>
<th>A</th>
<th>SA</th>
<th>Mean</th>
<th>Dec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I will have higher entry level position</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3.5</td>
<td>100</td>
</tr>
<tr>
<td>I will have more diverse job responsibilities</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>4.9</td>
<td>80</td>
</tr>
<tr>
<td>I will have higher entry level salary</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2.1</td>
<td>95</td>
</tr>
<tr>
<td>It will give me competitive advantage</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>2.8</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: Data Analysis, 2018

3.3 Constraints to achieving SAP ERP Software Skill

The constraints that the female participants face in acquiring the SAP ERP skill are presented in Table 4. Findings show that all the participants agreed that high cost of infrastructure was a challenge to learning since all the learning infrastructure must be in place. The infrastructure include electricity, computer system and networking, internet access, and training venue. Also, more than half (55.9%) of the female participants complained about the software not being user friendly. It commands a great deal of attention and learning by heart to execute the practical aspect of the learnings (called navigation). However, some (14.0%) of the participants who were not based in the three participating departments complained of having poor background in business processes even though they were able to catch up during the theoretical part of the training. The other constraints faced by almost one-quarter (23.8%) of the participants were related to the ability to pay the training fee and procurement of training materials, and payment for the proficiency exam to obtain the certificate. Considering the fact that most students in the public universities are barely able to cope with tuition, accommodation and other fees, they find it difficult to pay for such extra trainings for skill acquisition. This has reduced the participation in the acquisition of the skill since students now pay for the exams to obtain proficiency certificate.
Table 4: Constraints to achieving SAP ERP Software Skill

<table>
<thead>
<tr>
<th>Constraints to achieving SAP ERP Software Skill</th>
<th>No of students n = 143</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>High cost of infrastructure</td>
<td>143</td>
<td>100.0</td>
</tr>
<tr>
<td>The software is not user friendly</td>
<td>80</td>
<td>55.9</td>
</tr>
<tr>
<td>Poor background of business processes</td>
<td>20</td>
<td>14.0</td>
</tr>
<tr>
<td>Payment for training</td>
<td>34</td>
<td>23.8</td>
</tr>
<tr>
<td>Payment for examination to obtain proficiency certificate</td>
<td>34</td>
<td>23.8</td>
</tr>
</tbody>
</table>

Source: Data Analysis, 2018

4.0 CONCLUSION

Female participants in SAP ERP software learning had higher success rate than the general success rate. The expectations of the female participants were significantly high and they were involved in the learning and use of SAP ERP to have competitive advantage, diverse job responsibilities and higher positions in job place. The major constraints to acquiring the skill were high cost of infrastructure and the payment for training and examination to qualify to obtain proficiency certificate. Young women did not lack confidence in their capacities in a male dominated environment as the female participants were fewer but more successful in the use of the SAP ERP Software. Encouraging more female proficiency in software handling and use will make them involved more in the business world, and become more competitive. This will increase the involvement of women in technology and business for productivity and growth, to enhance economic development.

REFERENCES


