



An Investigation on the Challenges in Adoption and Utilization of ICT in Higher Institutions in the North East Geo – Political Zone, Nigeria

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ABSTRACT

Adoption and use of ICT in schools in Nigeria faces several challenges, including teacher's skills. For schools to benefit from using ICT, qualified teachers are needed. This study investigated teachers' challenges in the process of adoption and use of ICT in higher institutions in the North – East Geo – political zone. The study adopts descriptive survey research designs. 12 higher institutions were sampled through stratified sampling from a target population of the study. 240 respondents were sampled through simple random sampling. 235 questionnaires were appropriately filled and return. Data collected was analyzed by use of descriptive and inferential statistical techniques. Chi square test and weighted average using Statistical Package for Social Science (SPSS) software were used to analyze and interpret the data. The findings of this study reveal that teachers had a strong desire to integrate ICT into teaching-learning process even though with challenges. The major barriers were lack of genuine software, inadequate computer in the classroom, low speed internet, lack of motivation from both teacher and student side to use ICT, lack of proper training skills, unavailability of latest ICT equipment, lack of expert technical staff, poor administrative support. It was however, recommended that more ICT training should be given to teachers to make them effectively deliver ICT based curriculum. In-service courses should be designed that can enable teachers to acquire ICT skills.

Keywords: ICT Adoption, Teaching And Learning, Challenges and Higher Institutions

INTRODUCTION

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2005). A great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by Yusuf, 2005).

In a rapidly changing world, basic education is essential for an individual be able to access and apply information. Such ability must find include ICTs in the global village. The Economic Commission for Africa has indicated that the ability to access and use information is no longer a luxury, but a necessity for development. Unfortunately, many developing counties, especially in Africa, are still low in ICT application and use (Aduwa-Ogiegbean and Iyamu, 2005).

Teaching and learning processes have been transformed by introducing modern technological instruments. We can learn about the applications of modern information and communication technology (ICT) instruments in higher education institutions through their research. Information and communications technology (ICT) gadgets play an essential role in the workplace (Audi et al., 2021; Audi et al., 2021). When information and communications technology (ICT) first appeared, it impacted how people lived in society and how they performed their work in companies. In a variety of research studies, the usefulness of these modern information and communication technology (ICT) gadgets in the classroom is examined, as are teachers' evaluations of their effectiveness in the classroom during the teaching and learning process (Hevko, 2019; Celebi, 2019; Islahi & Nasrin, 2019).

Research shows that adopting and using ICT in schools leads to significant expansion of education and pedagogical outcome which are beneficial to both teachers and students. When used appropriately, ICT can help to strengthen the importance of education to increasingly networked society, raising quality of education by making learning and teaching an active process connected to real life (Zaman, Shamim & Clement, 2011). Further studies shows that the adoption and use of ICT in schools can promote collaborative, active and lifelong learning, increase students' motivation, offer better access to information and shared working resources, deepen understanding, help student think and communicate creatively (Khan, Hasan & Clement, 2012). In other words, ICT seems to change the way teaching and learning is carried out in schools. With emerging uses of ICT in schools, teaching could be changed from emphasis on teacher centered to student centered, hence creating interesting and interactive learning environment. ICT facilitates a pedagogical shift entailing an educational interaction between teachers and learners. However, studies suggest the benefits of adopting and use of ICT in schools all over the world has not been automatic. The effective implementation of ICT in schools is a multifaceted, complex process that just not involves providing the technology to schools but also involves teachers' competencies, schools readiness, long term financing and curriculum restructuring, among others (Zaman et al, 2011).

This study focuses on the challenges of integrating ICT gadgets into teachers' pedagogical practices. As a result, teachers' advanced skills and relevant knowledge serve as motivating agents for integrating these gadgets into pedagogical practices. For this reason, several research studies (Olofsson et al., 2018) examined the factors that were available and missing when using ICT devices in the teaching zone, as well as the factors that were required to make things possible or difficult for the proper attachment of these advanced ICT resources in the complex learning environment (Sipila, 2014).

Objectives

- This study was designed to investigate teachers' challenges in adoption and use of ICT in Public Higher Institutions in the North East Geo – Political Zone, Nigeria
- Ascertain the level of ICT usage Among staff and students in the higher institutions under review.
- Determine the availability and accessibility to ICT infrastructures in the institutions.

Skills and competences appropriate in adoption and use of ICT in school

Research as shown that genders differ in their use of and skills in ICT, where males tends to demonstrate better skills in pure technical issues, whereas females use ICT quite naturally in their normal practices. According to Jimoyiannis and Komis, (2007), male teachers are positive about ICT in school while female teachers are neutral or negative. Studies have cited female teachers low levels of ICT use due to their inadequate skills, interest and technology accessibility. However, some studies disclose that gender variable is not a forecaster of adoption and use of ICT in schools (Andoh, 2012).

Research shows that if teachers perceive ICT programs are either satisfying their own needs or their students' needs, it is likely they would implement it in school. It is suggested that teachers' adequacy, skills, and attitudes influence successful implementation of ICT in schools (Keengwe & Onchwari, 2011). If teachers' perceptions are positive toward use of ICT, then they can easily provide useful insight about its implementation. A study by Simonson (2008) revealed that teachers' skills, perception and attitudes were related to their use of ICT in teaching and learning. The more skilled teachers were in ICT, the more

likely they were to use it in classroom. Further study by Drent & Meelissen (2008) revealed that positive attitude, personal entrepreneurship and computer experience had a direct positive influence on adoption and use of ICT by teachers. A similar study by Huang & Liaw, (2008) shown that teachers' skills, attitudes and perceptions influenced their acceptance of the usefulness of ICT and its implementation in schools. A survey by EU School net in 2010 (cited by Andoh, 2012) involving teachers' use of Acer netbooks in six European Union countries, revealed that a large number of participants perceived use of netbook had positive impact on their learning, elicited interest, promoted in individualized learning and helped to lengthen study beyond school day. However, a study by Korte & Husing, (2007) suggested that small number of teachers perceived benefits of ICT in schools were not clearly identified.

Recently, experts have been working hard to integrate ICT into education. Recently developed ICT has a creative effect on people's abilities to seek knowledge. They suggested that new media are great presentation tools that focus on students. (Watson et al., 2011) According to Toro & Joshi (2012), advanced ICT media conduct fundamental changes in education. Modern teaching methods use computer apps. Facilitate classroom procedures using advanced technologies like the Internet and computer technology (Tunio et al., 2014). The Internet is a network of interconnected fast tracks that carry data between different communication channels (Freeman & Hasnaoui, 2010). Lindberg & Olofsson (2016) discussed how teachers could include ICT in the classroom. The results reveal that instructors utilize ICT to multitask. Without teacher beliefs and beliefs, the whole situation of ICT applications for education becomes agitated (Zhao, 2013; Heinonen et al., 2019). Teachers use ICT for classroom activities (Dabbagh et al., 2019), teachers use ICT for better cooperation (Ghavifekr & Rosdy, 2015), teachers use ICT for personal development (Ghavifekr & Rosdy, 2015). This study uses ICT as a motivational tool in Higher Institutions (Avidov-Ungar & Amir, 2018). Teachers use ICT to deliver excellent instruction in university classrooms (Mwendwa, 2017).

Social webs are the newest generation of advanced media sharing platforms that allow sharing and development of content. Teachers use YouTube to prepare lectures and connect with students to share ideas (Dabbagh et al., 2017). Other tools used (Twitter, wikis, Google, Facebook, etc.) (Dabbagh & Kitsantas, 2012). In the digital age, teachers have access to ICT resources (Chen, 2010), proven to be effective for many activities. In Higher Institutions, teachers have access to computer labs and internet facilities. Lectures are made more interesting through multimedia, Microsoft Word is used for report writing, PowerPoint for lesson presentation, ICT gadgets are used for multiple purposes, and digital libraries enhance knowledge (Bhattacharya and Sharma, 2007). (Siddiquah & Salim, 2017). The ICT use in Pakistan is still in its infancy, according to Tabassum & Shehzadi (2018). Despite university labs being well-equipped and most teachers employing computers as a teaching tool, teachers lack confidence in using ICT gadgets in the classroom. Thus, teachers lacking ICT abilities may lack confidence in applying technologies in their profession. Teachers must be trained in using modern ICT devices. Moreover, it improves their ability to implement modern teaching methods in their active work fields, thereby raising the quality of higher educational complexes for future generations. Azmi (2017) According to research, university professors and teachers have problems integrating ICT into their classroom activities. According to various research, teachers lack interest in using ICT devices due to insufficient computer applications available in laboratories and time management issues (Frost et al., 2017). (Miima, Ondigi, & Mavisi, 2013). The lack of ICTrelated courses (Tartarashvili, 2017) and teacher technical expertise about using these technologies (Lubis & Sarji, 2018) also made instructors less confident in the field of ICT (Nikolopoulou & Gialamas, 2016). Even though contemporary ICT gadgets are available for university lecturer, some still do not use them appropriately. Based on another work, several aspects failed to get superior results. New technology concepts were brought into the educational process in the digital age.

Researchers and educators started developing IT tools, hypertext, multimedia, and networking to create cognitive and constructivist learning environments. These tools did not produce better results than traditional education (Ali et al., 2018). Nikolopoulou & Gialamas (2016) emphasized two aspects for instructors' usage of advanced ICT devices. These were: teacher confidence and pedagogical skills of

using the latest ICTs in various classroom activities. Many studies show that lack of confidence is the main barrier to instructors using ICTs in their daily operations. Thus, a lack of confidence, time management, and understanding to integrate ICT makes teachers unwilling to use old ways in their teaching activities (Miima & Mavisi, 2013). Lack of confidence and ICT skills were also preventing teachers from using ICT in the classroom. Thus, teachers lacking ICT abilities may lack confidence in adopting these technologies in their profession (Cubukcuoglu, 2013).

Some teachers viewed ICT as waste of time and expensive. A report by Becta, 2008 on a survey of UK teachers (cited in Andoh, 2012) revealed that teachers' positivity about possible contributions of ICT in schools, was moderated as they became rather unsure and sometimes doubtful about specific and current advantages of it. Woodrow, (2002) points that for successful transformation of school practice; teachers need to develop positive attitudes toward innovations. Van Braak, Tondeur, & Valcke, (2008) argued that positive computer attitudes by teachers are expected to foster implementation of ICT in schools. Further study by Teo (2012) on teachers' attitudes towards computer use in Singapore, found that teachers were more positive about their attitude towards computers and intention to use them, than the helpfulness of computer towards teaching and learning. These paper reveal that teacher's skills, perceptions, and attitudes posed a challenge adoption and use of ICT in schools.

METHODOLOGY

This study employed a descriptive survey research design. Sekran (2007) observed that descriptive survey research is intended to produce statistical information about aspects of education that interest policy makers and educators. It is a method of collecting information by administering a questionnaire to a sample of individuals. Descriptive surveys are designed to obtain information about the current status of a phenomenon or to answer questions like where, what, how, why, when, and who. Hence, the study target 12 higher institutions in the Geo – political zone. Stratified random sampling was used to select two higher institutions from each of the six states that make up the zone in order to ensure all the states were adequately represented in the sample. Simple random method was then used to select respondents from various strata. There were a total of 12 higher institutions in the sample which included two higher institutions from each state of the zone. In the sampled schools, 15 Lecturers and administrators were randomly selected from each of the sample schools thus, making a total of 240 respondents.

Moreover, questionnaires were used as main instruments for data collection. Orodho, (2008) noted that questionnaires provide a cheap means of collecting data from large number of population. Both descriptive (mean and standard deviation) and inferential (Chi - square) statistics to analyze the data collected.

PRESENTATION OF RESULTS

Analysis Based On Likert Type Scale

Table 1: Present condition of the institution in terms of ICT service

Questions	Respondents	\bar{X}	χ^2	p-value	Remark
How well do you think that ICT system will be managed by your institution if it is introduced?	Teachers	3.42	.642	0.05	Rejected
	Administrators	3.33	.000	0.05	
Overall opinion of the quality of ICT service that your institution receives up to now.	Teachers	2.94	.000	0.05	Rejected
	Administrators	3.47	.564	0.05	

Table 1 shows that, around 48.7 % of the teachers think that they can use the ICT very well in the teaching learning process with sound confident and 51.3% of the teachers said that they are skilled enough to use the ICT in teaching-learning process, that is why the weighted average mean of the teachers shows high confidence of 3.42 about the use of ICT in teaching-learning process which is neither uncertain nor poor. Also the chi square value of 0.642 which is greater than critical value 0.05 means null hypothesis is accepted and teachers' opinions were rejected which is statistically insignificant.

The weighted average mean of the administrators show moderate value of 3.33 which means their confidence depends upon the teachers regarding ICT skills to manage their institution and the chi square value shows 0.00 which is less than the critical value of 0.05 meaning null hypothesis is rejected and the administrators „opinions are accepted which are statistically significant. Over 50% of the teachers and the administrators were in view that the quality of ICT service they receive in their institution is somehow average because of the many factors that were discussed earlier about the difficulty in the use of ICT in teaching-learning process. The weighted average is moderate about the quality of the ICT service received in the institution while the chi square value of the teachers shows 0.00 which is less than critical value of 0.05 meaning the null hypothesis is rejected and the teachers' opinions are accepted about the average level of the quality of service received in the institution which is statistically significant. On the other hand the chi square value of the administrators' shows 0.564 which is greater than critical value of 0.05 which means the null hypothesis is accepted and the administrators' opinions are rejected which is statistically insignificant.

Table 2: ICT existence in teaching-learning process (Teachers Opinion)

Questions	\bar{X}	χ^2	p-value	remark
Audio visual aids are adequately used for teaching learning purpose?	2.15	.001	0.05	rejected
ICT gadgets are technically and too complicated to use	1.51	.000	0.05	

Table 2 presents that 55.3% of the teachers agreed they used the existing audio visual aids properly in teaching learning. The weighted average shows moderate value of 2.15 while the chi square value shows 0.00 which is less than critical value of 0.05 meaning that teachers opinions regarding proper use of the audio visual aids in the teaching-learning process is accepted which is statistically significant and the null hypothesis is rejected.

Table 2 indicated that 38% of the teachers disagreed with the statement that ICT tools are complicated to be used in teaching-learning process. The weighted average mean of 1.51 indicates low opinions of the teachers regarding ICT tool complication while the chi square value of 0.00 which is less than the critical value of 0.05 meaning that the null hypothesis is rejected and the teachers opinions about the dissatisfaction is accepted and statistically significant.

DISCUSSION OF THE FINDINGS

With respect to barriers to computer and ICT usage, figure 1 reveals that no factor has the supreme majority for limiting the use of ICT in teaching-learning process in technical and higher educational institutions in North East Nigeria . This means all factors outlined below greatly limit the use of ICT in educational institutions in the North East Nigeria.

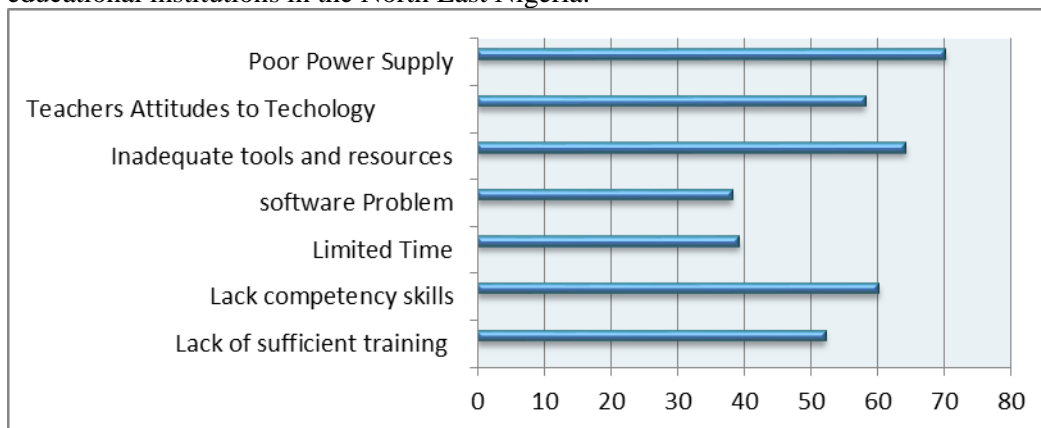


Figure 1: Factors that limit the use of ICT in teaching-Learning process

However, taban H., Abdallah A.M. and Chekum C. (2012) categorized the challenges into three levels- a)top level, b)middle level and the c)lower level which are analyzed below; (a) In the top level problems lack of software, lack of sufficient training, lack of learning equipment and computer problems were identified.

b) It was identified that teachers reluctant to use new technology, lack of motivation, lack of finance, delay in processing documents, lack of skilled personnel and of limited time were the mid-level problems.

c) The research findings identified lack of confidence, lack of knowledge; course material and political influence were the lower level problems.

Challenges of Using ICT in Educational Institutions

The respondents expressed their opinions in some open ended questionnaires, where many factors that limit the use of ICT in the educational institutions, seem to be noteworthy to a meaningful conclusion for this study. It has been found that there are many barriers related to teachers and administrators.

Constraints related to the teachers: Many teachers whom wanted to use computers for teaching-learning purpose said that there were inadequate computers in the classroom. However the content of the programmes were appropriate but resource material required to teach the courses both in soft and in hard form needs to be available to assist the students. More computers and more Labs need to be established so that the students should utilize the computers. It is found that though the numbers of computers at the

institution are less even though, some teachers used their own initiative in using their own personal laptops for the better teaching learning. Many teachers claim that if facilities are available then they can use those facilities and some are really ready to do so. Low speed internet, lack of computers skills, virus threat, lack of proper training, lack of skilled personnel, software problems, power problems, lack of motivation to encourage the use of ICT from the administration side, shortage of training, shortage of proper equipment and delay to purchase equipment are the remarkable causes that makes it difficult to use ICT in the teaching-learning process. More practical courses need to be given to students than theory. Availability of resources e.g., projectors, white boards and many others need to be put in all lecture rooms. Lecturers need to be provided with computers for planning their lessons in order to make the best use of the ICT in teaching-learning process. Some software is very complicated to use by some of the teachers/lecturers who have limited skills of ICT usages. Hence appropriate training should occur frequently. Lack of motivation on students is also a significant factor that limits the use of ICT. Students are reluctant to use online resources to help them in the academic process. Some students are weak and do not want to practice in using computers. Extreme course load was given on teachers due to the shortage of teachers. It was found from the structured question that most of the teachers had heavy class loads approximately over 30 hours per week which put extremely pressure on them. Though some of the teachers were interested in the use of ICT for preparing their teaching-learning materials, due to the heavy load they did not get enough time to do so. Due to heavy class loads, teachers became panic and depressed about the use of ICT.

The other important reason behind teachers' failure to use modern technology for effective teaching-learning process is job dissatisfaction. Their initiative, creativity, inventiveness became indolence because of job satisfaction. Many teachers of the institutions remained in the same status and in an unhappy salary position for a long period of time as they do not get any promotion due to wrong policies in the educational institutions and due to personal wrath of some administrators. As the teachers are very upset about their job career, they are not boosted to do any new changes for the institution.

Factors related to administrators: Institutions in North East Nigeria are lacking in ICT materials and professional instructors who are literally conversant with the interest in ICT techniques. Poor network providers, unreliable and slow internet connectivity make it challenges to use ICT and hence affect the teaching-learning process. For example- handling programmes like *CISCO* learning which needs constant network stability. Unreliable power supply and too much of power fluctuation also interrupts teaching and it is worse to the students especially when it comes to practical lessons. It was found that the lack of proper knowledge about the importance of using ICT by administrators was one of other factors that limit the use of ICT. Regarding the ICT integration into teaching-learning process the respondents gave several opinions as outlined in tables above. Other remarkable constraints are teachers' attitudes towards computers, poor funding, lack of teacher confidence, poor administrative support, lack of computer skills, poor course curriculum, lack of incentives, scheduling challenges, lack of training opportunities, and lack of skills in how to integrate ICT in education.

CONCLUSION

The aim of this research was to provide information of finding on the challenges that teachers faced in using ICT in their teaching-learning process. The findings of this study indicate that teachers have a strong desire for the integration of ICT into education but they encountered many barriers to it. These findings therefore have implications for training the teachers to become regular users of ICT focusing on acquiring basic IT skills. Since confidence, competence and accessibility have been found to be critical components for technology integration in institutions, ICT resources including software and hardware, effective professional development, sufficient time, proper training and development, sufficient time, proper training and technical support need to be provided to teachers. No component in itself is sufficient to produce good teaching environment. However, the presence of all components increases the probability of excellent integration of ICT in teaching-learning process. Therefore the training of teachers in the pedagogical issues should increase if teachers are to be convinced of the value of using ICT in their

teaching-learning process. Teachers need to take advantage of ICT resources offered at institutions. They need to be prepared beforehand to be competitively relevant to the teaching profession at this digital age. They ought to be open minded towards new approaches of teaching. Finally, teachers should acquire skills of self-organization which will help them a great deal in conducting their classes when using ICT.

RECOMMENDATION

Based on the findings of the study, the following recommendations were made: ICT projects and are financially demanding.

1. The use of ICT is too demanding hence, the Higher Institutions therefore require increased and adequate funding from Government and their proprietors to enable them provide the needed facilities, logistics and technical support required by ICT projects. Such increased funding will also make available to university management the finances to train, develop and retain ICT experts in their institutions.
2. Deliberate and sustained approaches should be taken to address ICT staffing. This includes strategies for retention of ICT staff, and for knowing that those who leave must be replaced. Such strategies may include offering ICT training opportunities and pay package. There should be adequate preparation of staff and students to improve their literacy level in ICT. This will help to create in them the willingness to embrace the challenges of integrating ICT into teaching and learning processes.
3. As a step towards actualizing above, the ICT units in Higher Institutions should organise orientation programs/workshops for staff to enhance their literacy level and the mandatory computer program for students should be reappraised to make it more practically oriented.
4. Teachers should be given sufficient training on how to integrate ICT in teaching and learning. Teacher training institutions should align their curriculum in order to train teacher trainees on skills and competences required for classroom teaching through use of ICT. Teachers should be trained on detailed use of ICT rather than general training on computer use. ICT skills on word processing and other packages need to be taught to teachers so that they can realize the importance of these packages in teaching.
5. To foster a positive attitude to teachers on use of ICT in teaching and learning, there should be comprehensive in-service courses. In-service courses should be designed that will enable all teachers to acquire ICT skills. Continuing professional development of teachers is central to successful implementation of ICT in educational institutions.

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