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The Role of ICT in Improving Teaching and Learning in Nigerian Universities

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Abstract: This study examined the role of ICT in improving teaching and learning in Nigerian universities. Three research questions were generated to guide the study. The study was carried out in the university of Nigeria, Nsukka, Nnamdi Azikiwe University, Awka and Michael Okpara University of Agriculture, Umudike. The study adopted a descriptive survey design. The population of the study was 360 out of which a sample 180 respondents were drawn and used for the study using simple random techniques. This is because the numbers were too large to manage. The sampled institutions were randomly assigned to 95 regular students, 60 sandwich students and 25 academic staff from the three selected Federal universities in South-East Region of Nigeria. The instrument for data collection was structured questionnaire. Frequency and simple percentage was used to answer the three research questions that guided the study. The findings of the study revealed that Nigeria University suffers lack adequate skills no online discussion with lecturers and there are partial limited bandwidths. Based on the findings of the study, recommendations were made among which are: the university should improve on power supply in university environment; Nigerian universities administrators should embark on awareness and training of students and staff on the use of ICTs to improve teaching and learning process; the internet should serve as backbone of ICT in Nigerian universities and government should make internet connectivity a priority in Nigerian universities to enhance the opportunities of ICT.

Key words: ICT, teaching, learning, distance learning, e-Learning, priority

INTRODUCTION

Information and Communication Technologies (ICT) have become everyday entities in all human endeavours and especially in teaching and learning in universities across the globe. For the past 25 years, the role of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavour within all social institutions. At present, every organization or business sector see the use of ICT as an added advantage, opportunity and compulsory consideration for any recruitment and as well regarding the ability to understanding ICT as skill and part of the foundation of education, alongside teaching and learning (Sharma *et al*., 2009). However, there also appears to be a misconception that ICTs generally refers to computers and computing of related activities with expected output. This is unfortunately not the case, although, computers and their application play a significant role in modern information management, other technologies or systems also comprise of the phenomenon that is commonly regarded as ICTs. According to UNESCO (2002) information and communication technology may be regarded as the combination of informatics technology with other related technology, specifically communication technology. The various kinds of ICT products available and having relevance to education such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audiocassettes and CD ROMs, etc. have been used in education for different purposes (Sharma *et al*., 2009).

Research by Anene *et al*. (2014) noted that there are developments in Nigerian universities with regards to the application of ICT in improving teaching and learning process. Also, ICT enhance teaching and learning including distance and online instruction which are recognized as viable tools necessary for preparing citizens to participate in the ICT driven global environment. The concepts; computer-aided teaching and computer-aided learning have given birth to computer-aided instruction which represents a combination of both teaching and

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learning process in the modern society specially when integrating the knowledge in the classroom teaching (Grant, 2004).

However, the increase rate of ICT advanced development has brought a lot of radical change in the way we teach, learn and communicate (Vassilos, 2012). According to Nwabueze and Ozioko (2011), Nworgu (2007) sees ICT as a set of tools that helps individuals to work with information and perform takes related to information process. Ritchie and Brindley (2005) define ICT as the collection of primarily digital technologies designed to collect, organise, store, process and communicate information within and outside to an organization for the purpose of disseminating information. It is therefore seen as those technologies like the simple telephone, internet, credit card facilities, etc. Ayannuga defined ICT as the marriage that exit between computer system and communication which can be described as the use of computer based technology and internet to make information and communication services available to a greater number of users. Jekayinoluwa and Ojo (2010) cited in Obanya ICT as a broad term that has to do with the harnessing of process, the methods and the product of electronic and communication related technologies and other resources for enhancing the productivity, the spread and efficiency of a set programme activities geared towards the achievement of a clearly determine goals.

Similarly, ICT has enabled many Nigerian universities become greatly interconnected, interdependent and without borders (Salawu, 2008). ICTs are changing the Nigerian society rapidly, creating a distance-less and borderless world of instantaneous communication (Spence and Smith). Also, several studies have highlighted the role ICT have played in repositioning education in Nigeria especially at the university level (Agbetuyi and Oluwatayo, 2012; Imhonopi, 2009; Imhonopi and Urim, 2011; Nwosu and Ogbomo, 2011).

A more recent study by Ayoola postulated that for any nation to boast of educational development, it should have a functional ICT driven education system in its institutions, so that, students can have access to the online information and digital collaboration opportunities which will help in the transformation and meaningful development of teaching and learning process. According to Osakwe (2012) outline some of the role of ICT plays in teaching and learning which include: it helps to promote fundamental changes in teaching and learning methods thereby helping to overcome the barriers of time and place as technology introduces new choices and opportunities for students and lecturers through endless research and learning on the internet; ICT provides students with practical and functional knowledge of the computer, the internet and other associated gadgets that will have positive effect on future experience and make them more competent, rational and comfortable in this era of globalization; ICT helps students to react intelligently to future changes, expand information and live successfully in a changing world; ICT, through its multimedia fact, creates room for students to acquire new knowledge, fosters enquiry and exploration of facts and adopt new approaches to teaching and learning; this conventional system helps to accelerate the learning process, increase lecturers efficiency and effectiveness and provides remedial instruction and enrichment of material thus, guaranteeing higher quality standards in the schools; ICT facilitates student's acquisition of skills and potentials for active participation in teaching/learning process and it also helps to enrich the curriculum by replacing the existing face-to-face instruction and ICT as a tool for learning enables students to efficiently access the digital information for the purpose of investigating issues and solving problems.

Furthermore, Nwabueze and Ozioko (2011) stated the use of ICT in education research and how to optimize the creativity of African Scientists through participation in international networks and working with data set; Accessing various kinds of research information which would necessitate a link to the libraries group; learning new methods for disseminating knowledge produced in Africa and using them ICT applications run through the entire gamut of the educational research process. The advocacy for the indispensability of ICT in educational research can be further strengthened by the following argument that tends to underscore the values derivable from applying ICT in educational research, it reduced time and cost of conducting educational investigation, data sets and library resources can be shared by institutions in different locations, educational researchers have easy access to current literature materials and data sets, irrespective of size can be stored and retrieved when needed. Moreso, the role of ICT does not only serve as bedrock in human endevours but also furnishes human beings with the understanding of the process of change and continuity in human affairs. In fact, there is no human endevours without ICT (Aduke, 2008).

Distance learning according to California Distance Learning Project (CDLP) is an instructional delivery system which connects learners with educational resources. It is also provides educational access to learners not enrolled in educational institutions and can augment the learning opportunities of current students. However, the implementation of DL is a process which uses available resources and will evolve to incorporate emerging technologies. The United States Distance

Learning Association (Anonymous, 2001) defines distance learning as the delivery of education or training through electronically mediated instruction including satellite, video, audio graphic, computer, multimedia technology and other forms of learning at a distance. The USDLA further refers distance learning to teaching and learning situations in which the instructor and the learner or learners are geographically separated and therefore, rely on electronic devices and printed materials for instructional delivery. Distance learning according to Swapp (2001) is the process of learning which provides educational access to learner's through the use of network technology to design, deliver, select, administer, support and extend learning. For the purpose of this study, distance learning can be defined as the means of learning through the separation of teacher and learner during at least a majority of each instructional process, the use of educational media to unite teacher and learner to carry course content, the provision of two-way communication between teacher, tutor or educational agency and learner and separation of teacher and learner in space and/or time.

Simply, e-Learning is the use of internet technologies to enhance knowledge and performance. e-Learning technologies offer learners control over content, learning sequence, pace of learning, time and often media, allowing them to tailor their experiences to meet their personal learning objectives. Imagine being able to access cutting edge knowledge and training on demand that is specific and in just the amount you need while being able to communicate with your peers, coaches and experts all through a simple Internet connection.

e-Learning according to Markus (2008) can be defined as a learning process created by interaction with digitally delivered content, network-based services and tutoring support e-Learning is any technologically mediated learning using computers whether from a distance or in face to face classroom setting (computer assisted learning) it is a shift from traditional education or training to ICT-based personalized, flexible, individual, self-organized, collaborative learning based on a community of learners, teachers, facilitators, experts. e-Learning according to Olojo *et al.* is also called web-based learning, online learning, distributed learning, computer-assisted instruction or internet-based learning. Historically, there have been two common e-Learning modes: distance learning and computer assisted instruction. Distance learning uses information technologies to deliver instruction to learners who are at remote locations from a central site. Computer assisted instruction (also called computer-based learning and computer based training) uses computers to aid in the delivery of stand-alone multimedia packages for learning and teaching.

Research by Olojo *et al.* stated that e-Learning and distance learning has become popular in teaching and learning because of its potential for providing more flexible access to content and instruction at any time from any place. The researcher's focus for policy consideration entails to increase the availability of learning experiences for learners who cannot or chose not to attend traditional face-to-face offerings and to provide more instructors to enable them handle more students while maintaining learning outcome quality that is equivalent to that of comparable face-to-face instruction. If student outcomes are the same whether a course is taken online or face-to face then online instruction can be used cost-effectively in settings where too few students are situated in a particular geographic location to warrant an on-site instructor.

In study carried out by Barron (2009) outline some benefits of distance and e-Learning technologies which offer numerous benefits to enhance teaching and learning in education such as convenience, flexibility, effectiveness and efficiency. Distance and e-Learning technologies can provide convenient locations for both students and instructors. Many of the technologies such as the internet and telephone are easily accessed at home (Ajadi *et al.*, 2008). Others as perceived by the same authors include: videoconferencing which can be distributed from a single point (such as a university) to multiple remote sites (such as schools). Satellite transmissions can be viewed at specified sites or the transmissions can be recorded for later viewing at home or school. This means that distance and e-Learning provide students the opportunity to participate whenever they wish on an individualized basis. For example, some students may want to read their e-mail during early morning hours before lectures or in the evening. In addition, one student may wish to spend 30 min reviewing a website while another spends an hour (Ajadi *et al.*, 2008). Not only is distance or e-Learning convenient it is also effective. Several research studies (Moore and Thompson, 1990; Verduin and Clark, 1991) have found that distance or e-Learning is equally or more effective than traditional instruction when the technologies used are appropriate to the instructional tasks when there is student-to-student interaction and when there is timely teacher-to-student feedback. Many forms of distance or e-Learning involve little or no cost. For example, almost all families in Nigeria have iPad, notepad, laptop, televisions and many are connected to a cable-TV service. For these

homes, it is relatively easy for the students to watch a public broadcast television show or educational documentary. In addition, almost all homes have access to a telephone or internet, enabling the use of voicemail and audio-conferences. Contrary to popular opinion, distance or e-Learning courses offer increased interactions with students. In particular, introverted students who are too shy to ask questions in class will often "open up" when provided the opportunity to interact via. e-mail or other individualized means (Barron, 2009).

Similarly, Olojo *et al.* highlighted the following as the benefits of e-Learning: it helps to remove barriers to achievement by providing new and creative ways of motivating and engaging lecturers and students of all abilities, enabling and inspiring everyone to attain their educational potential. It supports learning by offering differentiated learning, particularly for those who need support in literacy, numeracy and ICT. It offers a wide range of tools to enable lecturers and students to be innovative, creative and resourceful in all learning activities. Lecturers and students can easily customize digital learning resources to suit pace and level, appropriate to any learning style and ability. It creates on-line communities of practice. The internet can bring students learners, lecturers, specialist communities, experts, practitioners and interest groups together to share ideas and good practice. It provide an individualized learning experience for all learners, including those who are disadvantaged, disabled, exceptionally gifted with special curriculum or learning needs or who are in remote or away from their usual place of learning. It can facilitate wider participation and fairer access to further and higher education by creating the opportunity to start learning and to choose courses and support according to the learners' needs. It provides personalized learning support through information, advice and guidance services. It can help learners find the course they need with a seamless transition to the next stage of their learning, including online application or enrolment and an electronic portfolio of their learning to take with them.

In other to make e-Learning more effective in teaching and learning in Nigerian University and to improve the use of ICT in teaching and learning processes, the following steps can be adopted as postulated by Olojo *et al.* such as follows: Availability of hardware (particularly computers); Faster internet connectivity/improved bandwidth; Improved software, Appropriate policies favouring e-Learning, provision of technical support for e-Learning at a range of scales, lower prices for connectivity, availability of reliable electricity, appropriate content in appropriate languages, creating awareness about the value of e-Learning and improved training for teachers in e-Learning at all levels.

The three sample Federal universities can be viewed as recognized higher institutions of higher learning at present that takes advantage of the symbiotic relationship between the use of ICT in teaching and learning even though some lecturers among them appear to be still below average with the use of ICT facilities. However, in this context, Nweke *et al.* (2013) outlined the major roles which the use of ICT can play to enhance teaching and learning in Nigerian universities: To increase awareness, skills and expertise related to ICT; to optimize the utilization of resources and as well maximize the quality and efficiency of learning process, systems and activities; To facilitate effective and efficient communication thereby reducing over depended on paper/hardcopies; to conduct research and clear materials for teaching and learning; to reduce over library information, online distance and journal publications. To increase awareness and expertise in the areas of ICT.

In another study carried out by Folorunso *et al.* (2006) asserted that mass unawareness and low computer literacy level were identified as critical factors affecting the acceptability of distance and e-Learning by students and lecturers of Nigerian universities. Sharma *et al.* (2009) pointed out that distance and e-Learning places high demand on learners who have to be more proactive and disciplined than in traditional face-to-face educational system. Schulmeister (2006) states that experience proved that the benefits of e-Learning could not be fully taken advantage of expectations could not be met and that technology can be used as nearly in teaching and learning. Also, Resnick (2002) criticized that even though ICT is applied in teaching and learning, the approaches to teaching and learning remain largely unchanged.

In order to entirely profit from new ICT facilities, educational approaches and concepts on how ICT tools can support them should be fundamentally rethought. Investigation by Sharma *et al.* (2009), Nwagwu and Ahanihe (2006) indicate that the formidable challenge facing many Nigerian universities is lack of fund to build the required infrastructure and to produce teaching and learning materials. The researchers further highlighted other challenges such as: Limited expertise: inadequate trained personnel, poor internet connectivity and lack of adversity the internet, irregular power supply, effective use of ICT in teaching and learning. Financial restrictions: (cost of ICT equipments and diversion of funds provided for procurement of ICT facilities), lack of computer literacy, inappropriate teacher training, among others.

Statement of the problem: Although, existing factors and challenges remain, the future seems to point to the reliance of the educational system on ICT in developing nation like Nigeria and other counterparts. The focus of this study, therefore, is to examine the role ICT in improving teaching and learning in Nigerian context. This study is significant because education, especially in the Nigerian context is a key component of the human development mix of any country and harnessing ICT to drive the process which may bring about the expected dividends of literacy, industrial development and human capacity building. This study also examined the benefits of ICT in teaching and learning; ascertained the challenges that hinder effective implementation of ICT in improving teaching and learning in Nigerian universities and proffered strategies to improve teaching and learning with the use of ICT facilities.

Purpose of the study: The general purpose of this study is to examine the role of ICT in improving teaching and learning in Nigerian universities. Specifically, the purpose of this study is to:

- Ascertain the roles of ICT in teaching and learning in Nigerian universities
- Find out the challenges that hinder effective utilization of ICT to improve teaching and learning in Nigerian universities
- Determined the strategies to improve the utilization of ICT for teaching and learning in Nigerian Universities

Research questions: To achieve the purpose of the study, the following research questions were posed to guide this study:

- What are the roles of ICT in teaching and learning in Nigerian universities?
- What are the challenges that hinder effective utilization of ICT to improve teaching and learning in Nigerian universities?
- What are the strategies to improve the utilization of ICT for teaching and learning in Nigerian universities?

MATERIALS AND METHODS

This study adopted the use of descriptive survey design because it allows researchers to obtain information from a representative sample of the entire target population and describes situation as they exits (Creswell). Since, the study could not cover all Nigerian universities, the descriptive survey method was deemed as being appropriate. The study was carried out in the university of Nigeria, Nsukka, Nnamdi Azikiwe University, Awka and Michael Okpara University of Agriculture, Umudike as case study. To achieve the objective of the study, structured questionnaire was designed by the researchers and used to elicit information from the respondents. A reliability test was performed on the instrument after it was validated by experts in ICT unit and distance learning centre, University of Nigeria, Nsukka. The study adopted simple random sampling techniques to select 180 respondents comprises of comprised of 95 regular students, 60 sandwich students and 25 academic staff which were obtained as sample population. These three universities were selected as representative sample of other Nigerian universities in South-East Nigeria as well a leading institution in the area of ICT in teaching and learning. The researchers personally administered the questionnaires to the respondents. The data collected were analyzed using frequency and simple percentage.

Table 1: Classification according to population of the study

Respondents	Respondents	Percentage
Regular students	95	50
Sandwich students	60	33
Academic staff	25	17
Total	180	100

Table 1 shows the rank of respondents based on the population of the study. The table reveals that 95 respondents representing 50% are regular students, 60 respondents representing 33% are sandwich students while 25 respondents represent 17% are academic staff in the University of Nigeria, Nsukka.

RESULTS AND DISCUSSION

Research question 1: What are the roles of ICT to improve teaching and learning in Nigerian universities? Table 2 reveals that majority of the respondents are of the opinion that the introduction of information and communication has help to expand information and live successfully in a changing world and as well facilitates student's acquisition of skills and potentials for active participation in teaching and learning process. Based on the information from Table 2, a significant average percentage (65.56%) ICT as having the potentials to improve standard of education, enhance teaching and learning, promote interpersonal relation and as well enhances access to information among users.

Research question 2: What are the challenges that hinder effective utilization of ICT to improve teaching and learning in Nigerian universities? The data in Table 3 shows the challenges that hinder effective utilization of

Table 2: The roles of ICT to improve teaching and learning in Nigerian universities

Item statements	Yes	Percentage	No	Percentage	Total	Remark
ICT enables students to efficiently access digital information for the purpose of investigating issues and solving problems	220	61.11	140	38.89	360	Accepted
ICT helps to promote fundamental changes in teaching and learning methods thereby helping to overcome the barriers of time and place	236	65.56	124	34.44	360	Accepted
ICT provides students with practical and functional knowledge of the computer	224	62.22	136	37.78	360	Accepted
ICT helps students to react intelligently to future changes, expand information and live successfully in a changing world	222	61.67	138	38.33	360	Accepted
ICT facilitates student's acquisition of skills and potentials for active participation in teaching and learning process	189	52.50	171	47.50	360	Accepted

Table 3: Challenges that hinder effective utilization of ICT to improve teaching and learning in Nigerian universities

Item statements	Yes	Percentage	No	Percentage	Total	Remark
Nigerian Universities suffer irregular power supply	230	63.89	130	36.11	360	Accepted
Lack of adequate funding	240	16.67	120	33.33	360	Accepted
Lack competence/skills	200	55.57	160	44.44	360	Accepted
Partial limited bandwidth	305	84.72	55	15.28	360	Accepted
Poor technical infrastructure	205	56.94	155	43.06	360	Accepted
Students are uninterested to learn with ICT facilities	110	30.56	250	69.44	360	Unaccepted
High costs of ICT equipments	185	51.39	175	48.61	360	Accepted
Inadequate ICT courses in school curriculum	290	80.56	70	19.44	360	Accepted

Table 4: Strategies to improve the utilization of ICT for teaching and learning in Nigerian universities

Item statements	Yes	Percentage	No	Percevtage	Total	Remark
Create enabling environment by making ICT facilities available	245	68.06	115	31.94	360	Accepted
Making acquisition of ICT skills mandatory for students and lecturers	235	62.27	125	34.72	360	Accepted
Making ICT skills a compulsory task for staff promotion and employment	222	61.66	138	38.33	360	Accepted
Training students and staff on the use of ICT facilities	185	51.39	175	48.61	360	Accepted
Provision of uninterrupted power supply to Universities	250	69.44	110	30.56	360	Accepted

ICT to improve teaching and learning in Nigerian universities. From the result, the respondents acknowledged that all the items in the table are challenges that hinder effective utilization of ICT to improve teaching and learning in Nigerian universities except item number 6 with 250 respondents who answered no representing 69.44% with the question "students are uninterested to learn with ICT facilities". The same response answered yes representing questions 4, 5, 7 and 8 representing; partial limited bandwidth, poor technical infrastructure; high costs of ICT equipments and inadequate ICT courses in school curriculum.

Research question 3: What are the strategies to improve the utilization of ICT for teaching and learning in Nigerian universities? Table 4 shows the responses of respondents on the strategies that can be used to improve the utilization of ICT for teaching and learning in Nigerian universities. From the table above out of 360 respondents, 245 (68.06%) accepted (yes) that creating enabling environment by making more ICT facilities available is one of the strategies that can be used to improve the utilization of ICT for teaching and learning in Nigerian Universities while 115 respondents with 31.94% answered No. 235 (62.27%) respondents answered yes with the question "making acquisition of ICT a mandatory skills for students and lecturers" while 125 respondents with 34.72% respondents answered No. 222 (61.66%) respondents accepted that making ICT skills a compulsory task for staff promotion and employment will improve the utilization of ICT for teaching and learning in Nigerian universities while 138 (38.33%) respondents answered No. Also from Table 4, 185 (51.39%) respondents answered yes that training students and staff on the use of ICT facilities will improve the utilization of ICT for teaching and learning in Nigerian universities while 175 (48.61%) respondents answered no. Table 4 also shows 250 (69.44%) respondents answered yes that providing standby generator for power supply in Nigerian University will improve the utilization of ICT for teaching and learning while 110 (30.56%) respondents answered no. From the table, the result shows that the respondents accepted the fact that all the items listed in the table above are strategies that can be used to improve the utilization of ICT for teaching and learning in Nigerian universities.

The results from Table 2 reveals that majority of the respondents are of the opinion that the introduction of ICT has help to expand information successfully in a changing world and as well facilitates student's acquisition of skills and potentials for active participation in teaching and learning process. The findings from the

above study agreed with the findings by Osakwe (2012) who outline the role of ICT in teaching and learning as a process which has helps to promote fundamental changes in teaching and learning methods thereby helping to overcome the barriers of time and place as technology introduces new choices and opportunities for students and teachers through endless research and learning on the internet. Also, justifying this finding, Nwabueze and Ozioko (2011) examines the role of ICT in enhancing education through teaching and learning new methods for disseminating knowledge produced in Nigeria. In addition, the data obtained from the field reveals that there is an increasing awareness about the populace on the importance of ICT in promoting teaching and learning process.

On the challenges that hinder effective utilization of ICT to improve teaching and learning in Nigerian universities, the respondents accepted that the major problems include: irregular power supply, lack of adequate funding, lack competence/skills, partial limited bandwidth, poor technical infrastructure, students are uninterested to learn with ICT facilities, high costs of ICT equipments and inadequate ICT courses in school curriculum. The result showed that lack of these facilities affect the implementation of ICT in teaching and learning. Lack of incorporation of ICT into the higher institutions would have negative impact in students learning. There should be adequate facilities for the implementation of ICT in Nigerian universities. This is in line with the views of Grant (2004) who noted that adequate facilities are required for implementation of ICT in schools. From the study, the role of ICT has not started impacting on the student's teaching and learning.

The result of the findings in Table 4 showed that the respondents accepted that the strategies to improve the utilization of ICT for teaching and learning in Nigerian universities include creating enabling environment by making ICT facilities available, making acquisition of ICT skills mandatory for students and lecturers, making ICT skills a compulsory task for staff promotion and employment, training students and staff on the use of ICT facilities and provision of uninterrupted power supply to universities. This is in line with the viewed of Nweke *et al.* (2013) who outlined the strategies to improve the utilization of ICT in teaching and learning in Nigerian Universities by increasing the awareness, skills and expertise related to ICT, to reduce over library information, online distance and journal publications, to increase awareness and expertise in the areas of ICT and to provide appropriate policies favouring e-Learning and availability of reliable electricity.

CONCLUSION

The role of Information and Communication Technology (ICT) in improving teaching and learning in Nigerian universities cannot be overemphasized. Despite the fact that some lecturers in Nigerian universities do not support the introduction and adoption of ICT facilities into the universities, majority of lecturers strongly feel that ICT is the most tool to overcome the problems encountered in teaching and learning process. ICT has also become a major key tool in acquiring, processing and disseminating adequate knowledge especially in the 21st century.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

- The National Universities Commission (NUC) should make the use of ICT as a mandatory skill for all lecturers and students to enhance teaching and learning in university environment
- Computer Literacy Certificate Programme should be made compulsory for graduate and undergraduate students and not just in their field of the study
- The knowledge of ICT should be the first consideration for promotion and employment for academic staff in the universities
- There is a need to improve on power supply in the university environment
- The Federal government should make internet connectivity a priority in Nigerian universities to enhance the opportunities of ICT to lecturers and students

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