INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) AND LECTURERS' PROFICIENCY IN NIGERIAN UNIVERSITIES

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ABSTRACT

Nigerian universities are increasingly being confronted with a number of challenges which demand urgent attention. These challenges tend to be characterized by globalization, shrinking time and space, declining capacity building, competition among universities, and rush for ranking syndrome. To survive and succeed, it is imperative that the present environment should integrate ICT into university management. The purpose of this study is to examine the impact of ICT on lecturers' proficiency in Nigerian universities. The research design adopted was a descriptive survey. Stratified random sampling technique was used to select 500 respondents from ten Federal Universities using simple random sampling. An instrument titled ICT integration and lecturers' proficiency questionnaire was used to collect data. A test re-test method was used in order to ascertain the instrument reliability and a coefficient of .65 was obtained which means that the instrument is reliable. The data collected were analyzed using SPSS version 16. Results indicated that ICT has a powerful multiplier effect on university education in terms of lecturers' proficiency which significantly influences the university vision and mission. It is recommended that a public enlightenment campaign be launched for lecturers and students in order to be ICT compliant.

Keywords: ICT, Nigerian universities, lecturers' proficiency

INTRODUCTION

Information and Communications Technology (ICT) has become an essential tool in the world today. The world has moved from the Agrarian age where land was the most important source of capital and power from the industrial age, when machines were the critical driving force in development, to the information age in which information itself is the strategic resource.

Today, Information and Communications technology is seen as the acquisition, processing, storage and development of vocal, pictorial, textural and numeric information by a micro- electric based combination of computing and telecommunication (Lucey, 1995). The philosophy behind communications technology is the increased availability of information.

Unfortunately, Nigerian universities are increasingly facing many challenges and complexities, which include students' enrolment, access and equity, program diversification, functionalism in the educational system infrastructural facilities, inadequate funding, capacity building and lack of motivation needed among lecturers to adopt or adapt ICT as teaching tools.

The Nigerian University Network (NUNET) was concerned during one of the preparatory mission visits for the proposed Nigerian Federal Universities Sector Investment Project undertaken in 1994 by the World Bank. The World Bank observed that African countries are not well represented when compared with other regions of the world in the dissemination and use of computers, electronic networking, CD-Rom and related technologies. Following the World Bank reports, the National University Commission (NUC) quickly decided to address the communication problem in the Nigeria university system.

In pursuance of the objectives, the "Electronic Networking of Nigerian Universities" Project commenced in 1995 with the objective of eliminating the poor networking and inefficient collaborations of academics in Nigerian universities as compared to the advanced world. Later, the NUC requested all federally funded universities and university centers to set up Communications Networking in their institutions.

Furthermore, Obasanjo (the president of Nigeria then) in 2006 set up the National Communication Commission (NCC), National Information Technology Development Agency (NTDA) and National Airspace Research Development Agency (NERDA) similar to the USA National Aeronautic and Space Administration (NASA) and e-Nigeria. The setting up of these agencies aimed at pushing the country toward meeting the Millennium Development Goals (MDGs) (Idowu, Esere, & Omotosho, 2009).

ICT has been recognized as a potential instrument for promoting lifelong education, distance and adult education for national development and for building competitiveness of the country (Muangkeow, 2007). Therefore, this study is designed to find out the relationship between ICT and lecturers' proficiency in Nigerian universities.

The Government's National Policy on ICT

The National Policy for ICT lists 31 general objectives for ICT utilization (FRN, 2001). Only three of these, xv, xvi and xvii focus on education related issues:

xv.   Empowering the youth with IT skills and preparing them for global competitiveness

xvi.   Integrating IT into the mainstream of education and training

xvii.   Establishing IT institutions as centers of excellence to ensure Nigerian competitiveness in international markets.

The Policy further highlighted strategies for realizing these objectives and noted the government's resolve to restructure the education system at all levels by allocating special IT funds to education. A perusal of the 59-page document clearly reveals the government's determination and intended commitment to ICT utilization for educational, economic, socio- cultural and political development. In the analysis of IT policy by Yusuf (2005), nine strategies can be identified for building knowledge and information technology: (i) Making ICT use compulsory for all levels of the educational system; (ii). Developing specific ICT curriculum for primary, secondary and tertiary institutions; (iii) Using ICT for distance education; (iv) companies that are ICT oriented making investment in education; (v) special study, research and scholarship grants for ICT; (vi) Training the trainer scheme in ICT for National Youth Service Corps members; (vii); Growth of private and public sectors dedicated to the three levels of the educational system; (viii) ICT capacity development at zonal, state and local levels and; (ix) working with international and domestic initiatives for transfer of ICT knowledge.

Besides the fact that education has no specific ICT application, the strategies related to education in the policy are in reality market driven; such a situation does not encourage unrestricted ICT utilization in the school system. The policy's silence on teacher education and their ICT professional development has dampened the enthusiasm for ICT utilization in the classroom (Abolade & Yusuf, 2005; Yusuf, 2005).

The observations on the national ICT policy notwithstanding, the government's current efforts at enhancing ICT use in the Nigerian educational system has resulted in the formulation of an education initiative called e-education (Ajayi, 2000; Yusuf, 2005), which is seen as an electronic mode of knowledge sharing and transmission which may not necessarily involve physical contact between lecturer and student. It represents a combination of teaching and learning (Mac-Ikemenjima, 2005). The objectives of this e- education project include:

i.   Enhancing access to quality education for all learners;

ii.   Improving the education delivery system using ICT tools in the teaching-learning process;

iii.   Ensuring optimal utilization of existing resources available at private and public institutions at the local, state and Federal levels to minimize duplication;

iv.   Ensuring a globally competitive educational system using ICT as delivery system (as being practiced in developed and several developing countries); and

iv.   Reducing, eliminating social vices in the school system (e.g., malpractices and students' poor performance)

Electronically delivered learning (e-learning) has become one of the most important and potential significant and efficient instructional methods to improve teaching and learning. It is useful in transcending the boundaries of traditional classroom instruction. Apart from creating virtual schools (learners learn anytime, anywhere), it promotes equity by providing students with access to courses which may not ordinarily be available (Kayode, Alabi, Sofoluwe & Oduwaiye, in press; Stensaker, Maassen, Borgan, Oftebro & Karseth, 2007; Young, 2002).

Generally speaking, e-learning that involves applications and processes such as web-based learning, computer-based learning; virtual classroom and digital through internet, intranet, extranet (LAN/WAN), audio and videotape, satellite broadcast, Interactive TV and CD- ROM (Kaplan-Leiserson, 2000). E-learning can be beneficial to any students irrespective of background as a result of enhanced learning opportunities provided by ICT (Motiwalla, 2007). E-learning and the consequent utilization of ICT thus provide both accelerated and essential knowledge which eventually lead to increased graduation rate and lower dropout rate. In some of the Nigerian universities several undergraduate courses are being taught and examined electronically via electronic Courseware and Computer Based Tests (CBT). Though still in its infant stage, it is already a success story of ICT utilization in the curriculum of higher education at university level. This is no doubt a commendable effort on the part of the university authorities.

ICT Integration in Nigerian Universities

According to the National Policy on IT (2001), providing more educational opportunities for citizens is one of the important government policies, widely and equally enhancing knowledge, both urban and rural areas, regardless of their economic status. Creating better educational opportunities will reduce differences between the knowledge levels of the population. The NUC has been developing and providing these opportunities through:

- Developing the NUNet IT infrastructure to connect every higher education institution to the internet for education and research.

- Supporting production of courseware for dissemination via NUNet.

- Developing the Learning Management System (LMS)

- Developing the e-learning and the learning resource sharing center.

RESEARCH QUESTIONS

This study was guided by the following research questions:

1. What is the level of ICT integration in Nigerian universities?
2. What is the level of lecturers' usage of ICT software in Nigerian universities?
3. Is there a positive and significant relationship between ICT integration and lecturer proficiency in Nigerian universities?

METHODOLOGY

Research Design

This study adopted a quantitative method using the correlation type of *ex-post facto* design. This is a systematic inquiry approach in which variables are not controlled by the researcher because their manifestations have occurred. Two variables were identified: ICT as the independent variable and lecturers' proficiency as the dependent variable.

The Sample

The target population of this study comprised all Federal Nigerian Universities. Ten universities were randomly selected using the table of random numbers after the universities had been stratified. A total of 500 respondents were purposefully selected from the sampled universities. The list of the sampled universities is shown in Table 1.

Table 1

List of Sampled Universities

	Name	Abbreviations
1.	Ahmadu Bello University, Zaria	ABU
2.	University of Abuja, Abuja	ABUJA
3.	University of Benin, Benin - City	UNIBEN
4.	University of Ibadan, Ibadan	UI
5.	University of Ilorin, Ilorin	UNILORIN
6.	University of Lagos, Lagos	UNILAG
7.	University of Agriculture, Abeokuta	UNAB
8.	Federal University of Agriculture, Makurdu	UNIMAKURDI
9.	Federal University of Technology, Akure	FUTA
10.	Federal University of Technology, Minna	FUTMINNA

Instrumentation

An instrument tagged "ICT and lecturers' proficiency questionnaire" was designed for this study. The questionnaire consisted of three sections. Section A inquired about the personal profile of the respondents. Section B was concerned with ICT integration while section C was all about lecturers' proficiency. The instrument was adopted from Sofoluwe (2005). Steps were taken to ascertain the instrument validity and reliability. The drafted questionnaire was given to experts in educational technology and measurement and evaluated for face and content validity. The corrected version was then sent out to forty lecturers who were not part of the sample. Three weeks later, another set of the questionnaire were sent to the same respondents for test re-test method of reliability. The data collected were analyzed and a reliability coefficient of .65 was obtained. This shows that the instrument is reliable

Data Collection Procedure and Analysis

The data were collected personally by the researchers with five research assistants comprising two teachers and three undergraduate final year students. Letter of introduction were taken to the HODs of the sampled schools for their approval before copies of the questionnaire were distributed to the selected lecturers. The questionnaires were then retrieved after three to five days, although some were collected after one week. The data collected were analyzed using SPSS v. 16. The first two research questions were analyzed using descriptive statistics whereas the third research question was analyzed using inferential statistics (Pearson product moment correlation statistics).

RESULTS

Research Question 1: What is the level of ICT integration in Nigerian universities?

Table 2
ICT Integration in Nigerian Universities

S/N	Strategies	Percentage
1.	Commitments	70
2.	University Development	60
3.	Lectures/Students Focus	80
4.	Process Orientation	61
5.	Continuous Improvement	77

In this study, ICT integration was examined through commitment, university development, lecturer/student focus, process orientation and continuous improvement. According to Sofoluwe (2005), ICT commitment involves investigation, evaluation and adoption of ICT for administrative effectiveness in Nigerian universities; Organization development entails integration of ICT into key management process, education, training and offering of employee support. Student focus involves determination of work teams, analyzing customers and services. The process orientation is the ability to identify, standardize, and improve process control while continuous improvement is the ability to develop methods for identifying opportunities and integrating the improvement processes into daily operations.

As shown in Table 2, 80% of the respondents consider ICT integration in lecturers/students focus, 61% considered ICT as being integrated in process orientation, 60% see ICT as being integrated in the university overall development, 70% considered ICT as being integrated in the university commitment

while 77% see ICT as a tool for continuous improvement in the university system. Overall, the researchers therefore concluded that ICT integration in Nigerian universities is high.

Research Question 2: What is the level of lecturers' usage of ICT software in Nigerian universities?

Table 3
Lecturers' Expertise in ICT Software Usage

S/N	Use of ICT	Percentage
1.	Word Processing	89
2.	Spreadsheet	25
3.	PowerPoint	28
4.	Email	100
5.	Internet Browsing	100
6.	Web Page Designing	10

Table 3 reveals that all lecturers made use of email and internet browsing with 100% respectively. A total of 98% of the respondents made use of Word Processing. The main areas where ICT application seem not to be popular among the respondents (lecturers) were spreadsheet, PowerPoint and webpage designing with 25%, 28% and 10% uptake respectively. This means that the lecturers are not used to PowerPoint presentation. This will definitely affect their job performance in this era of globalization. Most of the schools upload student results on the internet through computation of such result on Microsoft Excel. This is evidence that such lecturers give out jobs to other persons to perform which can also affect the authenticity of the results. The researcher therefore concludes that the lecturers still have a lot to learn in order to carry out their job effectively using ICT software and tools.

Research Question 3: Is there a positive and significant relationship between ICT integration and lecturer proficiency in Nigerian universities?

H_O: There is no significant relationship between ICT and lecturers' proficiency in Nigerian universities

Table 4
ICT and Lecturers' Proficiency in Nigerian Universities

Variable	No	X	SD	df	Calculated F – Value	Critical F – Value	Decision
ICT	500	86.60	7.37				H_O
				499	.28	.20	Not Supported
Lecturers' Proficiency	500	41.10	10.52				

Table 4 shows that the calculated value .28 is greater than the critical value of .20 at the .05 level of significance and for 499 degrees of freedom. Hence, the null hypothesis which stated that there is no relationship between ICT and lecturers' proficiency is rejected. Thus, the findings suggest there is positive and significant relationship between ICT and access to education in Nigerian universities. In other words, the more the government and university administrators integrate ICT into university programs, the higher the level of lecturers' expertise.

DISCUSSION OF FINDINGS

 On the integration of ICT as revealed in Table 2, lecturers/ students focus is considered the most critical stage. Also considered are continuous improvement, commitment, process orientation and university development. This is in line with findings of Uche (2006) that academic staff and students significantly utilize the internet for accessing course materials and for checking research materials more than administrative staff. This is in light of the fact that academic staff and student activities revolve around teaching, research and courses (New Mexico State University Library, 2002; Sofoluwe, Akinsolu, & Kayode, 2013).

According to Mac-Ikemenjuma (2005), ICT plays a key role as an enabler that helps us to better manage the complex information flow and integrate such information in policy formulation in order to maximize human capital and potential in society. Thus, ICT involves developing effective and integrated tools as well as training modules to enhance ICT application through effective teaching and learning.

On the contrary, the work of Akindolu (2002), Oyebanji (2003), Kalu and Ekwueme (2003) negate the findings of this study. They found poor application of these tools in academic staff in the institutions. Ololube (2008) found that over 70% of Nigeria's public universities and Nigerians themselves depend on the government to provide ICT materials in universities. This overwhelming dependence on the government has often left higher education institutions poorly equipped.

The findings in Table 3 indicate that university lecturers have inadequate ICT knowledge. Larsen and Vincent-Lancrin (2005) found ICT proficiency to be a promising way of improving tertiary education quality and teaching-learning effectiveness. These promises could be derived from different characteristics of ICTs: the increased flexibility in student learning experience provided; the enhanced access to information resources for more students; the potential to drive innovation; and effective ways of learning and teaching, including learning tools, easier use of multimedia or simulation tools and the possibility to diffuse innovations at very low marginal cost among teachers and learners.

ICTs allow institutions to give students a wider variety of learning paths than in non-ICT supplemented institutions. However, some obstacles in integrating ICT include lack of resources and materials, insufficient guidelines, inadequate training and technical support, lecturers' lack of knowledge and skills

(Mac-Ikemenjima, 2005; Modebelu & Jannet, 2014; Venkataraman & Sivakumar, 2015). Ololube (2008) has argued that the diffusion of modern technology in teaching and learning depends on the degree to which a large segment of students and faculty have acquired the knowledge and skills required for ICT usage. It was further revealed that in almost all the universities, core information about courses or taught topics were not given online. In the universities, online or CD – ROM packages could not be used to demonstrate professionally relevant techniques. Teaching of courses through ICT was not evident in the sampled universities.

The findings in Table 4 indicate that the relationship between ICT and lecturers' proficiency in Nigerian universities was significant. It implies that, when applied to education, ICT enhances effective knowledge delivery and access, produces richer learning outcomes, encourages effective critical thinking and generally improves the quality of teaching and learning. These findings are consistent with that of Larsen and Vincent-Lancrin (2005); Muangkeow (2007); Jaffer, Ng'ambi, and Czerniewicz (2007); Oliver (2003); Idowu, Esere and Omotosho (2009); and Olorundare (2010). Sofoluwe (2005) found that ICT developments have changed the availability of information in higher education and ICT is a diverse set of technological tools and resources used to create, store, manage, communicate and disseminate information. ICT is unquestionably a crucial tool for education. Its contribution is proven not only by many recent academic studies, but also by the experiences of the past years showing the rapid growth of digital learning and ICT based industry. Furthermore, ICT tools including television, radio, computer and internet have been used for many years as powerful tools for people to gain knowledge and educational information. When used appropriately, ICT tools can help expand access to education, strengthen the relevance of education to the expending digital workplace, and raise education quality.

As ICT is being used to improve educational services, its applications help the institutions in providing value-added support services to students. Examples of such services include the use of smart card for attendance system and online teaching, and learning assessment through online facilities. ICT integration in higher education can also be seen through the implementation of e-learning, lectures and presentations in order to support teaching and learning activities.

ICTs potentially offer increased possibility for codification of knowledge and for innovation in teaching activities in order to deliver teaching and cognitive activities anywhere at any time. ICT is more learner-centered, self-paced, and problem-solving-based than face- to - face teaching. ICTs are available for knowledge sharing, remote access and team work and organizing and coordinating tasks over wide areas (OECD, 2005). Besides that, ICT contributes to knowledge advancement by expanding and widening access to education by improving the quality of education and reducing its cost.

Besides that, ICT in higher education gives easier and almost instant access to data and information in a digital form allowing manipulations that are sometimes not otherwise possible. ICT provides opportunity for lifelong learning and builds a knowledge-based society, hence enhancing national competitiveness.

Muangkeow (2007) found that ICT has provided opportunities for developing the NUNET, supporting the production of courseware for dissemination, developing learning management systems and providing the e-library, e-community and learning resource sharing centers.

On the contrary, Larsen and Vincent-Lancrin (2005) emphasized that ICT can create organizational conflicts and tension. Muangkeow (2007) found that ICT is confronted with insufficiency of instructional designers and programmers, as well as shortage of hardware and software. Despite the linkage of some institutions of higher learning to integrate ICT, they face enormous problems in its proper implementation. The most significant problem is poor ICT penetration and usage among higher education practitioners. Almost all national basic ICT infrastructure is inadequate, a result of a lack of electricity to power ICT materials and poor telecommunication facilities.

Poor economic conditions and their effect on middle level manpower stand as a major barrier to ICT implementation. Even an average middle income earner cannot afford basic technological communication gadgets. Thus, computer related telecommunication facilities might not be overly useful for most Nigerian students and faculty members, as computers are still very much a luxury in institutions, offices and homes. This has made integrating of necessary online resources (e-mail, world wide web, etc.) into higher education most difficult (Ifinedo & Ololube, 2007). The denial of assistance and absence of interaction has had adverse consequences, both on the psyche of faculty and on the implementation of the infrastructure necessary for professional development (Commonwealth of Learning International, 2001).

The African Association of Universities (2000) identified some obstacles in the introduction and utilization of ICTs as poor national telecommunication infrastructure, lack of enabling environment, internet traffic congestion or saturation due to limited bandwidth, non-reliability of electricity supply, high internet service costs, inadequate and irregular funding of ICT initiatives and prohibitive importation costs of ICT equipment. The challenge of integrating ICT into tertiary institutions is immense. It is obvious that there is little or no usage of ICT at this level of our educational system.

The findings in Table 4 are aligned with Al-Zoubi, Kahhaleh, Hasan, and Kharouf (2007) who found that web page design is an important component of e-education, particularly for posting lecture notes, homework, quizzes and other appropriate material essential for interacting with students using portals or websites in a virtual environment. Expertise of lecturers with ICT will improve the quality of education and training. It enhances learners' motivation and engagement, acquisition of basic skills and services as transformational tools when used appropriately.

However, in examining the factors preventing lecturers from implementing computer use in teaching, Goodison and Lewis (2004) identified lack of resources and materials, insufficient guidelines, inadequate training and technical support, besides lack of knowledge and skills.

Sometimes, lectures are given inadequate training which not only make lecturers less confident but also burden them with having to relearn the necessary ICT skills.

RECOMMENDATIONS

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

ICT should be introduced immediately as a general and compulsory course in all tertiary institutions in Nigeria irrespective of the students' discipline. The tertiary education curriculum should be reviewed to reflect more practical course in ICT for pre-service and in- service lecturers. This will enable all Nigerian graduates to have a good knowledge of the principles of ICT. Each university should step up its own enlightenment campaign through seminars, workshops, newsletters and other publications.

At the university management level, there must be effective policies to make balanced investments and increase funding in higher education programs that will provide resources needed to effectively implement the use, integration and diffusion of ICT.

The relevant skills for training and maintenance acquisition of software, especially those necessary for taking major decisions such as computation of seminar results, student registration and other management functions should be developed by universities for effective and efficient educational management.

An overhaul of the technology transfer process is essential including stipulations for the acquisition of skills, knowledge and abilities.

Universities need to develop new applications and approaches to teaching in order to maintain the learning objectives according to the curriculum. Lecturers need to think creatively in fulfilling the student learning needs by restructuring the present teaching methodologies.

Tertiary institutions should be well equipped with adequately functional and well-furnished computer laboratories/cybercafés for lecturers and students. New lecturers must be trained to develop the needed ICT skills and to develop positive attitude toward ICT use for teaching and research while old lecturers should be encouraged to have basic knowledge of computer applications.

There is urgent need for partnership and networks as a possible way for investment, product development and innovation diffusion in e-learning. Partnership and networking can be achieved through sharing materials, joint technology and software development, joint research and development, joint marketing, joint training and connectivity.

CONCLUSION

From this study, the rapid rate of change and development of new technologies means that education programs must keep pace with the knowledge and skills demanded by educational stakeholders. ICT is a diverse set of technological tools and resources used to create, store, manage, communicate and disseminate information when used appropriately. ICT can help in expanding access to education, strengthening the relevance of education to the expanding digital workplace and raise educational quality. Unfortunately, ICT in Nigeria has not been fully implemented. It is therefore crucial that universities equip their students, administrators and lecturers with appropriate knowledge, skills and aptitudes to improve competitiveness in a shrinking labor market.

REFERENCES

Abolade, A. O., & Yusuf, M. O. (2005). Information and Communication Technologies and the Nigerian Teacher Education Programme. *African Journal of Educational Studies*, *3*, 1-19.

Ajayi, A. (2000). Summary of online discussions on ICT in higher education institutions in Africa. Retrieved from http://www.aau.org/english/documents/aau-ictreport-p4.htmlANNEX4

Al-Zoubi, A., Kahhaleh, B., Hasan, O., & Kharouf, H. (2007). Future Potential of ICT Implementation in university education in Jordan. In *Conference ICL2007, September 26-28, 2007*. Kassel University Press.

Commonwealth of Learning International. (2001). *Building capacity to deliver distance education in Nigeria's Federal University System*. Report prepared for the World Bank.

Federal Republic of Nigeria. (FRN) (2001). Nigeria National Policy for Information Technology (IT). Retrieved from http://www.nitda.gov/docs/policy/ngitpolicy.pdf

Idowu, A. I., Esere. M. O., & Omotoso, J. A., (2010). The challenges of ICT and higher education system in Nigeria. In D. O. Durosaro & A. A. Adegoke (Eds.), *Higher education and globalization* (pp. 39-48). Lagos, Nigeria: Stirling-Horden.

Ifinedo, P., & Ololube, N. P. (2007). A discourse on the problems, prospects, and progress of distance education in a developing country. In E. P. Bailey (Ed.), *Focus on distance education developments* (pp. 183-194). New York, NY: Nova Science.

Jaffer, S, N'gabi, D., & Czernievicz. (2007). The role of ICTs in higher education in South Africa. One strategy for addressing teaching and learning challenges. *International Journal of Education and Development (JEDICT), 3*(4)*,* 131-142.

Kaplan-Leiserson, E. (2000). Glossary. Retrieved from http://www.learningcircuits.org/glossary.html

Kayode, Alabi, Sofoluwe, & Oduwaiye. (In press). Implementation of mobile teaching and learning in university education in Nigeria: Issues and challenges. A. Zhang (Ed.). *Handbook of Mobile teaching and learning*. Berlin, Germany: Springer-Verlag.

Larsen, K., & Vincent-Lancrin, S. (2005). *The impact of ICT on tertiary education: Advances and promises*. OECD/NSF/University of Michigan Conference, Washington DC.

Lewis, D., & Goodison, R. (2004). Enhancing learning with information and communication technology (ICT) in higher education (no. RR533). Wolver Hampton, England: University of Wolver Hampton for the UK Department of Education and Skills.

Lucey, T. (1995). *Management Information Systems*. London: DP Publications.

Mac-Ikemenjima, D. (2005, April). *E-Education in Nigeria: Challenges and prospects*. A Paper presented at the 8th UN ICT Task Force Meeting. Dublin, Ireland.

Modebelu, M. N., & Jannet, A. O. (2014). Academic staff challenges to effective utilization of information and communication technology (ICT) in teaching/learning of agricultural education. *International Letters of Social and Humanistic Sciences, 2*, 88-96.

Motiwalla, L. F. (2007). Mobile learning: A framework and evaluation. *Computers & Education, 49*(3)*,* 581-596.

Muangkeow, S. (2007). *Integration of ICT in higher education provision: The case of Thailand*. Paper presented at the Regional Seminar on Making a Difference: ICT in University Teaching Learning. Indonesia: Ministry of Education.

New Mexico State University Library. (2002). Using internet for academic research. Retrieved from http://lib.nmsu.eduu/ital/reserach.html

OECD. (2005). *E-learning case studies in post-secondary education*. Paris, France: OECD

Oliver, R. (2003). *The role of ICT in higher education for the 21st Century: ICT as a change agent for education*. Perth, Australia: Edith Cowan University.

Oliver, R., & Towers, S. (2000). Bench marking ICT literacy in tertiary learning settings. In R. Sims, M. O. Reilly & S. Hawkins (Eds.), *Learning to choose: Proceedings of the 17th Annual ASCILITE Conference* (pp. 381 – 390). Lismore, NSW: Southern Cross University.

Ololube, N. P. (2008) Computer communication and ICT attitude and anxiety among higher education students. In A. Cartelli (Ed.), *Encyclopedia of information and communication technology* (pp. 100-105). Hershey, PA: Idea Group.

Ololube, N. P., Eke, P., Uzorka, M. C., Ekpenyong, N. S., & Nte, N. D. (2009, December). Instructional technology in higher education: A case of selected universities in the Niger Delta. In *Asia-Pacific Forum on Science Learning and Teaching, 10*(2)*,* 1-17.

Olorundare, A. S. (2010). *Utilization of information and communication Technology (ICT) in curriculum development implementation and evaluation*. A paper presented at the 1st International Conference on higher Education: Collaboration of Education Faculties in West Africa (CEFWA). Ilorin, Nigeria: University of Ilorin.

Sofoluwe, A. O. (2003). Integration of online into distance education in Nigeria. *Nigeria Journal of Education Foundation, University of Ilorin, 6*(1)*,* 1-8.

Sofoluwe, A. O. (2005). Relationship between communication technology (ICT) and administrative effectiveness in Nigeria universities. *The Social Studies Education. Ghana: University of Education, 2*(1)*,* 54 – 63.

Sofoluwe, A. O. (2007). Nigerian University Network (NUNET). Key to improving efficiency in University management. *International Journal of Educational Planning and Administration (IJAPA), 1*(3)*,* 151-171.

Sofoluwe, A. O., Akinsolu, A. T., & Kayode, D. J. (2013). Managing university education for national transformation in Nigeria. In A. O. Ayeni, U. G. Emetaron, A. O. Okwori, J. A. Undie & J. E. Okon (Eds.), *Managing education for national transformation* (pp. 210-224). Lagos, Nigeria: The Nigerian Association for Educational Administration and Planning (NAEAP).

Stensaker, B., Maassen, P., Borgan, M., Oftebro, M., & Karseth, B. (2007). Use, updating and integration of ICT in higher education: Linking purpose, people and pedagogy. *Higher Education, 54*(3)*,* 417-433.

Uche, C. M. (2006). Level of internet usage among staff and students of the University of Port -Harcourt. Implications for quality research and management decision making. *Nigeria Journal of Education Administration and Planning (NAEAP), 6*(2)*,* 257-270.

Venkataraman, S., & Sivakumar, S. (2015). Engaging students in group based learning through e-learning techniques in Higher Education System. *International Journal of Emerging Trends in Science and Technology, 2*(01)*,* 1741-1746.

Young, K. (2002). Is e-learning delivering ROI? *Industrial and Commercial Training, 34*(2)*,* 54-61. doi: http://dx.doi.org/10.1108/00197850210417537

Yusuf, M. O. (2005). ICT and education: Analyzing the Nigeria National Policy for Information Technology. *International Education Journal, 6*(3)*,* 316-321.

Yusuf, M. O. (2006). Problems and prospects of open and distance education in Nigeria. *Turkish Online Journal of Distance Education, 7*(1)*,* 22-29.