



# The Challenges and Prospects of E-learning in Nigerian Polytechnic Education: A Case Study of Kaduna Polytechnic, Kaduna State, Nigeria

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## Abstract

There are significant challenges and prospects of e-learning in Nigerian polytechnic education. The process and applications of e-learning technologies include computer-based learning, web-based learning, virtual learning, network learning, tele-learning, blended learning, hybrid models, internet learning, computer-assisted learning, online classroom and digital collaborations where contents is delivered via the internet/extranet, audio, video, tapes, satellite TV and CD ROM. In Nigerian polytechnics the commonest type of e-learning adopted is inform of lectures. Education is the foundation of innovation and development. The role of e-learning in teaching and learning process cannot be overemphasized. E-learning is one of the most efficient tools for advancing knowledge, skills and development in any nation. It is necessary for quality education in Nigerian tertiary institutions. Education refers to the process of receiving or giving systematic instruction, especially at a school or polytechnic. The act or process of imparting or acquiring general knowledge, developing the powers of reasoning and judgment and generally preparing oneself or others intellectually for mature life. This paper provides the concepts, benefits, challenges and prospects facing e-learning education in Nigerian polytechnics. The purpose of this study is to identify the challenges and prospects of e-learning in Nigerian polytechnics. The paper recommends that government at all levels; non-governmental organizations and private sectors should assist to equip polytechnic's e-learning centers with modern equipment for effective delivery of lectures to students with e-learning technologies. E-learning represents an entirely new learning environment where information and communication systems, whether networked learning or not, serve as specific media to implement the learning process for students. In response to the fast development in Information and Communication Technologies (ICT), e-learning was therefore adopted by many universities and other higher institutions around the globe as a way of improving and supporting their teaching-learning activities and making education accessible for all society members. Unfortunately, this rapidly changing technological resource along with the ever growing and mobile society has no doubt created many challenges for students, teachers, parents, administrators and policymakers particularly in developing countries. This actually made the paper to assess the e-learning structure in term of physical infrastructure and human development at the Kaduna Polytechnic, Kaduna State, Nigeria through data collected both by structured interview and questionnaires. The analyses of which the states of development are at low realm therefore, call for a robust synergy that will be able to meet and cope with the test of the time.

**Keywords:** E-learning, Challenges, Polytechnics Education, Virtual Learning, Computer-based Learning, collaboration

## 1. Introduction

The aims of establishing polytechnics in Nigeria is to train technologies, technicians and management skills in courses leading to the awards of certificate, ND, HND and Advance Professional Diploma which are relevant to the needs, aspirations and development of the nation's diverse economy and industries. E-learning refers to electronic learning, this means using a computer to deliver part or all of a course whether in a school or a full distance learning course. Higher education is regarded as an instrument of social, political and economic



development. The products of higher education in any nation will determine the development of such nation. Therefore, higher education contributes to national development through high level relevant manpower training in order to acquire both physical and intellectual skills which enable individual to be self-reliant and useful members of the society (FRN, 2004).

According to Udokang (2006), education is the provision of opportunity for a child to realize his/her potentials, goals and abilities in life. Education includes the acquisition of functional skills, moral identity and attribution to succeed in life and thereby improve the society (Fareo, 2012). The yearnings, needs, aspirations as well as the cultural heritage and environment of any society determine, to a large extent the kind of knowledge and skills to be acquired (Adebosin, 2004). The National Policy of Education (2004) states that education has been adopted as instrument per excellence for effecting national development. Polytechnics is where the innovatory approach to educational provisions and instructional deliveries are acquired with the high level manpower, intellectual and future leaders are developed technologically. It is a place where students come together to pursue knowledge and promotes the development of intellectual capacities of individuals to understand and appreciate their environments (Ajayi, 2003). Polytechnics therefore educate future leaders and develop the high-level technical capacities that underpin economic growth and development (Odekunle, 2001). Polytechnics education is at the centre of human resource development and advancement.

Consequently, the term “e-learning” originates from electronically-assisted learning, or learning with and through the use of technologies. Other commonly used to explain e-learning terms include online learning, computer assisted learning or ICT in education. E-learning is considered as an innovative approach for delivering electronically, well-designed, learner-centered and interactive learning environments to anyone, anyplace, anytime, most especially by utilizing the internet and digital technologies in line with instructional design principles E-Learning, therefore, incorporates both content (curriculum) and instruction (pedagogy). The benefit of e-learning which is numerous, include harnessing network technologies and wireless devices that make teaching and learning to take place within and beyond the traditional classroom environment via electronic learning or e-learning (Farrel, 2007). This allows students in one place to learn from instructors in another place, thus overcoming the physical boundaries and in many instances, time constraints. At the same time, makes students from low income families and those who live far away from the city without the convenience of accessible transport to participate in e-learning, acquire knowledge and obtain training that is aligned with their aspirations and goals. As a matter of fact, many institutions, instructors, and policy makers have taken advantage of the flexibility of online learning to cater to the needs of current and potential students at all levels of education, including those who were unable to attend traditional courses on campus (Daniel, 2009). In fact, the rapid expansion of ICTs in Nigeria has offered opportunities that promote distance education. Unfortunately developing countries are still far behind from getting benefit from the e-learning due to very high primary cost of infrastructural development and poor public access to internet and other ICTs. For instance, e-learning in Nigerian tertiary institutions is still a dream because of poor ICT infrastructure and other socio-economic reasons. It is also noted that in Nigeria, while very few of our conventional universities are now carrying out their academic activities through one form of ICT or the other, the urge to embark on e-learning is still a dream to some because their infrastructure of ICT’s which is still very weak. It is against this background that the paper takes a critical look of all the available ICT facilities at the Kaduna Polytechnic, Kaduna State. Along the line, the paper equally examines the development of human resources in the institution. At the same time, it identifies the challenges for proper development of ICT and finally provides appropriate measures that are necessary to promote teaching and learning through ICT.

### **1.1. Study Area and Method**

The study area which is the Kaduna Polytechnic, Kaduna State was established in 1956 as Kaduna Technical Institute after the British Government accepted the upgrading of Yaba Higher College (now Yaba College of Technology) to a Technical Institute and also propose the establishment of Technical Institute in Kaduna and Enugu through the recommendation of the Higher Education. The Northern Nigeria Executive Council at its meeting of 17<sup>th</sup> August, 1962, conclusion No.1, re-designated the technical institute, Kaduna as the



polytechnic, Kaduna. It became Kaduna Polytechnic in 1968 by the federal government Decree No.20 of 1968, which was revised in 1979 by Decree.

Kaduna polytechnic is one of the earliest polytechnics in Nigeria located at Tudun Wada area of Kaduna South local government of Kaduna State, North-Western Nigeria. The polytechnic commences E-Learning on 1<sup>st</sup> June, 2020 which is been developed by the Kaduna Polytechnic ICT in collaboration with Adhyay foundation, India. The E-learning is conducted using the following Kadpoly-Adhyay Learning Management System (LMS) platforms.

- i. Virtual Classrooms
- ii. Digital Learning
- iii. Computer Based Test (CBT)

## 1.2. Statement of the Problem

The polytechnic education system in Nigeria is widely known to provide technical education to develop technological manpower of the nation's economy. Consequently, this system of education needs all well equip laboratory, workshop and a constant field trip to enhance the achievement of its aim. With a constant yearning for inclusion of e-learning and CBT into this system of education, there is a need to ask whether these platforms can provide the necessary learning environment to develop technological manpower. Hence, the problem of this research is to examine the challenges, prospects and issues of e- learning environments into polytechnic education system. Based on the foregoing, the following research questions were raised:

1. Can e-learning enhance the practical knowledge of the student?
2. Do students understand lectures done through e-learning?
3. Is e-learning relevant in the polytechnic education system?
4. Can CBT effectively test the practical knowledge of the student?

## 1.3 Significance of the Study

The importance of this research is to explore the challenges and prospects of the relevance of e-learning in the selected Nigerian polytechnic education, and this will be helpful for polytechnic educational management as well as the government of the nation to formulate policy on e-learning platform as relate to polytechnic education.

## 2. Background of Related Fundamental Concepts

E-learning refers to the use of modern technologies such as computers, digital technology, networked digital devices (e.g. the internet) and associated software and course ware (Wikipedia, 2014). E-learning as opposed to distance learning is a term that is used to refer to all ICTs, networks, internet and other forms of electronic media that can be used to enhance teaching and learning so as to transfer knowledge and skills ( Kassa & Balunywa, 2013).

E-learning is an inclusive term that describes educational technology that electronically or technologically supports learning and teaching (Wikipedia, 2014). Parks (2013) suggested that “e-” should refer to “everything, everyone, engaging and easy” in addition to ‘electronic’. Developments in internet and multimedia technologies are the basic enablers of e-learning, with consulting, content, technologies, services and support being identified as the five key sectors of the e-leaning industry (European Commission, 2000). Regardless of the educational level or stage e-learning can be adopted, used or applied in the education for effective teaching and learning. E-learning is a learner-controlled, self-paced education environment where the learner has authority over the learning environment; thereby allowing learners to work at their pace, convenience (Eke, 2011). The changes in education have lead to a paradigm shift from teacher centredness through to learner centredness (Kassa & Balunywa, 2013). The extent to which e-learning assists or replaces other learning and teaching approaches is varied ranging on a continuum from none to fully online distance learning (Bates and Poole, 2013).



Daniel (2009) observed that e-learning plays an important role in professional development for adults in the workforce. As the world strives to meet development goals, there is increasing recognition of the potential of e-learning to meet growing educational challenges.

Furthermore, the word E-learning which is known as a modern distance learning is a new form of teaching device by which students, most especially the distant learners are provided with access to the learning and instructional materials through any appropriate electronic media such as the mobile phone, television, radio, etc. E-learning is as well considered as distance education that involved all the digital technologies, including: computer, scanner, printer, telephone, internet, Digital Satellite System (DSS), Direct Broadcast Satellite (DBS), pocket-switching, fiber optic cables, laserdisc, microwaves, and multi-media systems for collection, processing, storage and dissemination of information all-over the world. It involves revised curriculum, infrastructure, teacher professional development, textbooks, and exams. This actually makes E-learning as education of the wholesome integration of modern telecommunications equipment known as Information Communication Technology (ICT) resources, particularly the internet. Generally, e-learning is of two major forms. One is called synchronous and the other is asynchronous. The synchronous simply means "at the same time," and it involves interacting with an instructor via the Web in real time. As a matter of fact, the synchronous form has comprehensive features like the forum chatting and audio-effect that allow for interactivity between the learning content and the learners. Asynchronous on the other hand means "not at the same time," therefore, allows the student to complete the course at their own time and schedule, without live interaction with the instructor. In fact, asynchronous form of e-learning on the other hand is the direct opposite of synchronous form. Whereas, the latter by design has multifarious features, and the former does not. It only presents the learning content for the students to read, internalize and download if need be. Also, whereas synchronous e-learning allows for immediate feedback as much as possible, asynchronous may not necessarily allow for immediate feedback. Developing countries are faced with many e-learning challenges. Thai universities revealed that instructors and students faced great challenges with e-learning with reports that all instructors interviewed had little or no experience with online teaching methodology and consequently lacked confidence in implementation of e-learning. He further pointed out that the students have poor availability of access points, slow network communications, and lack of software application as their challenges to participating in e-learning. At the same time, these findings equally noted that Thai instructors had failed to see the value of e-learning and were disinterested in implementing e-learning, while students complained about the poor ICT infrastructure. The major problems facing the proper implementation of e-learning in Nigerian tertiary institutions are the high cost of computer and laptop when considering the income level of an average worker in Nigeria. In fact, very few people have access to computer and in most cases, the very few who have access to the computer do not know how to use it and maximize its usage.

### **2.1. Information Communication Technology (ICT) and E-Learning**

Information Communication Technology (ICT) refers to the totality of methods and tools that are used in gathering, storing, processing and communicating information. ICT has found application in virtually all the available professions in the world. Professionals in different fields called it by different names. When ICT is used in education or to foster learning, it is called E-learning Technology or Educational Technology. In the broadcasting profession where ICT is used as a communication tool, it is commonly referred to as Electronics Information Technology or just Communication Technology. A careful consideration of the meaning and scope of ICT makes it easy to think that hardly can any profession survive or continue to be relevant without the integration of ICT. ICT encompasses all the technologies used to transmit or disseminate information to an audience. These cover internet services provision, telecommunications equipment and services, media and broadcasting and other related information and communication activities. Modern ICT products include e-mail, voice mail, FAX, internet, electronic bulletin boards, cellular phones, video conferencing among others. In the teaching profession, distance education programme is now accepted world-wide as a standard alternatives mode of education due to the use of ICT (Ojokheta & Adepoju, 2007). ICT improves instruction and more learners can be catered for.



### **2.1.1. Advantages of E-Learning**

Advantages of e-learning technologies according to Bhuasiri, Xaymoungkhoun, Jeung and Cigenek (2011) include:

- a. Increase in accessibility to information,
- b. Better content delivery,
- c. Personalized instruction,
- d. Content standardization,
- e. Accountability,
- f. On-demand availability,
- g. Self- pacing,
- h. Interactivity,
- i. Confidence and
- j. Increased convenience

The above advantages of e-learning are based on the benefits it provides to stakeholders in educational sector. Bhuasiri, et al, (2011) noted that, in developing countries e-learning is still in its infancy and early adoption stage and the countries experience challenges unique from developed countries.

## **2.2. Issues, Challenges and Prospects of E-Learning Technologies in Nigerian Polytechnics**

E-learning technologies development is faced with a lot of challenges in Nigerian Polytechnics. One of these challenges is inability of teachers to assist the students develop the ability and knowledge necessary to make them utilize the e-learning effectively. In many e-learning projects, students face some challenges of bad perception during their studies; lack of pedagogy in their curriculum, lack of user touch and feel in their e-learning platform (Allen & Seaman 2003; Ostund, 2005).

Consequently, ICT holds great potential to support ongoing education as well as national development efforts, several challenges have affected its large scale deployment and utilization for educational purposes and these reduce its capacity to do the nation good. Some factors have affected the effective deployment and utilization of ICT for educational purposes in Nigerian polytechnics education.

Furthermore, some e-learning studies conducted in developing countries show lack of vision and framework in implementing e-learning lead to failure of these e-learning projects (Pal, 2006, Kizito & Bijan, 2006). Lack of both technical and social skills required for the implementation of e-learning contributes to failure of e-learning projects. Four obstacles affecting the total implementation of e-learning in Nigerian polytechnics education are:

### **2.2.1 Connectivity**

Limited or lack of connectivity in many developing countries including Nigerian Polytechnics impedes access to online learning e.g. (E-learning).

### **2.2.2 Equipment**

E-learning requires equipment that can facilitate learning, but in some of the Nigerian Polytechnics, the equipment such as computers, digital technology, and internet are not available for proper utilization. Inadequate ICT infrastructure including computer hardware and software as well as bandwidth/ access.

### **2.2.3 Software**

Software enables educators to design and develop learning contents and platforms. This software is costly and not available for use in some of the polytechnics to facilitate e-learning programme.





#### **2.2.4 Training:**

No combination of connectivity, equipment and software will achieve anything if people are not trained to use them (Daniel, 2009). Some lecturers and students are not trained to make use of some of the e-learning equipment.

The main prospects of the Nigerian polytechnics e-learning efforts is to encourage staff and students of the polytechnics to adopt and imbibe the culture of using technologies to support such provision and deliveries such as developing capacity in e-learning and provide leadership in the aspect of ICT utilization also to raise general awareness of the academic community of e-learning tools to provide systematic and continuous support for staff and students in the use of e-learning services.

### **3. Research Methodology**

It is very essential and important to fully elaborate the methods used in collecting the data of the research. The questionnaire and interview method are employed in the findings, the data collection is been sourced from primary and secondary data.

#### **3.1 Population of the Study**

These refers to the total number of staff ICT knowledge, ICT training, ICT training location, teaching method, student background, computer devices and computer devices usage all were investigated. The research studies the population of the selected areas of e-learning of the Kaduna Polytechnic, Kaduna State.

#### **3.2 Sample and Sampling Techniques**

A sample is a subset of the population that is taken to be representative of the entire population. The research adopted random sampling technique, a situation where each individual or unit of the population has an equal or chance of being selected. The data of the research where collected based on questionnaire in order to obtain information on the challenges, prospects and issues on e-learning in the Nigerian polytechnics education system with a case study of Kaduna Polytechnic.

#### **3.3 Instrument for Data Collection**

The study employed a survey research design that aim at determining the level of ICT facilities, human development and constraints. The compilation of data which was majorly through primary survey involves field observation, questionnaires and structure interview as a design instrument. A total number of 360 questionnaires were randomly distributed among students and staff across all the departments including the polytechnic library. The analysis of the collected data was purely descriptive which involves the use of quantitative tables for the presentation of the data.

### **4. Results of Findings**

The data collected actually involved both the human and physical infrastructure and the major constraints. Base on the statement of the problem, the following points were raised:

- i. E-learning enhances and facilitates the practical knowledge of the students base on the result of the research, it's an innovative approaches for delivering teaching-learning electronically.
- ii. Students understand lectures delivered through e-learning more effectively despite the inadequate infrastructural development.
- iii. E-learning is very relevant in the polytechnic education system as it electronically or technologically supports and provides modern teaching-learning environment as well as flexibility of online learning.



- iv. CBT can effectively test the practical knowledge of the student thereby advancing the technical assessment using a platform for evaluation and measurement of the students’ performance more efficiently.

#### 4.1 The Human Resources

The human resources are all about the staff and student development. In fact, the staff development variables include the level of ICT knowledge; ICT training attended; Type of ICT training and their teaching format. At the same time, the student development variables are student background, form of their computer devices, and format of their computer device usage. It is interesting to note from the Table 1 below that majority of the staff are computer literate but not fully ICT compliance while less than 10 percent of the staff are completely illiterate in computer and ICT.

**Table 1: Staff ICT Knowledge**

ICT Knowledge	No. of Respondents	Percentage
ICT and computer literate	15	25
Computer literate without ICT	40	67
ICT and Computer Illiterate	5	8
Total	60	100

**Table 2: ICT Training Attendance**

No. of ICT Training	No. of Respondents	Percentage
Once	12	20
More than once	3	5
None of the above	45	57
Total	60	100

As revealed in Table 2 above, majority of the staff have not participated in any ICT training programme followed by those who have participated once while those who have participated more than once have the least percentage.

**Table 3: ICT Training Mode**

Training Location	No. of Respondents	Percentage
In-house training	13	21.67
Out-house training	2	3.33
None of the above	45	75
Total	60	100

In the same vein, it is noted in table 3 above that majority of the staff that participated in ICT training was through in-house programme while very few of them did their training outside/abroad.

**Table 4: Teaching Format**

Teaching Method	No. of Respondents	Percentage
Chalk board teaching	56	93.33
Slide projection	4	6.67
Close circuit	0	0
Total	60	100

The traditional method of classroom interaction between students and tutors still remains the only format of impacting knowledge to the students as indicated above. However, slide projection is used occasionally. In fact, close circuit television system remains dormant.



**Table 5: Student Background**

Student Background	No. of Respondents	Percentage
Computer literate/computer device	234	78
computer literate only	15	5
Computer illiterate	51	17
Total	300	100

The variable considered for the student e-learning development include the student background, their available computer devices and the usage of the devices. Available data indicated that majority of the student are computer literate with computer device while those who are computer illiterate and without computer constituted the minority.

**Table 6: Computer Devices Possession**

Computer Devices	No. of Respondents	Percentage
Browsing phone only	138	46
Browsing phone/laptop	90	30
None of the above	72	24
Total	300	100

As a matter of fact, majority of these students are only in possession of mobile phone. This is followed by those with the laptop and mobile phone while those with none formed the least category.

**Table 7: Computer Devices Usage**

Computer Devices Usage	No. of Respondents	Percentage
Task performing tools	93	31
Source of knowledge	135	45
None of the above	72	24
Total	300	100

Majority of the students use the computer devices as tool to perform a task. However, some use them as source to acquire knowledge while none of the students see these devices as unserviceable.

## 4.2 Physical Infrastructure

Data collected on ICT physical infrastructure are of two forms. They are buildings and the necessary tools. The polytechnics have five ICT building, namely the digital library, the ICT training centre, ICT secretariat and two ICT resource centers. The necessary tools include computer system with wireless connectivity, computer system with cable connectivity, local server, and internet service, projector with screen, multimedia, printer and scanner. The digital library and the training center are provided with the highest number of facilities. The secretariat is next in the provision of some necessary facilities while the two resource centers are yet to be provided with necessary tools as shown in the Table 7.

## 4.3 Major Constraints

The noticeable major constraints for e-learning in the polytechnic by both staff and the student are inadequate and high cost of internet services as well as erratic power supply. However, the management considered lack of funds and technical assistance both local and international as the major challenge to develop e-learning.



#### 4.4 Discussion of Finding

Basically there is no gainsaying of the fact that both human and physical infrastructure developments are very paramount for e-learning. Unfortunately they are not fully developed at the Kaduna Polytechnic, Kaduna State. For instance, many staff are not only ICT compliance even though they claimed to be computer literate as result of their Microsoft knowledge in computer. This attributed to the low level of ICT staff training and development. The physical infrastructure is also not only inadequate in terms of building; they are as well not properly equipped with computer facilities. Available records confirmed that ICT materials such as computers, printers, scanners, e-books, textbooks, workshops and books on ICT are not fully adequate and not in use in Nigerian schools for computer education.

The inadequate infrastructure development has no doubt led to weak e-learning process. The poor internet services and erratic power supply actually make almost all the academic staff to find it difficult to prepare and deliver their lectures through e-learning. At the same time, most students are unable to receive and enjoy the benefits of e-learning. In fact, the few benefit enjoy by some students are costly because they do not have access to polytechnic internet services again, the findings no doubt agree with fact which revealed that few students that are privileged to have a PC/laptop are not connected to the internet as this attract extra cost which they cannot always afford.

**Table 7: Physical Infrastructure**

Building tools	Digital library	Training centre	Secretariat building	Resource center
Wireless computer	√	x	√	√
Cable computer	x	√	x	√
Local server	√	x	x	√
Internet service	√	x	√	√
Projector /screen	√	x	x	√
Multimedia	x	√	√	√
Printer	√	x	√	√
scanner	x	x	√	√

#### 5.0 Conclusion

Nigerian polytechnics were established to facilitate creation of new knowledge, innovation and technologies for the overall socio-economic empowerment of individual and national integration. The roles of e-learning in teaching and learning process cannot be overestimated, especially in Nigeria where emphasis is being placed on technological development.

E-learning is a powerful tool that can be used to enhance and encourage teaching and learning process in polytechnics. Through e-learning classes, students will be able to work independently and acquire more knowledge in their disciplines. Both the government and stakeholders should join hand together to ensure adequate provision of e-learning resources to our polytechnics to facilitate technological advancement and to aid teaching and learning process.

E-learning is a modern pedagogy of which the applications and process include computer-based learning, web-based learning, virtual classroom and digital collaboration where contents are delivered via the internet, intranet/extranet, audio and or video tapes, satellite TV and CD-ROM. Unfortunately, e-Learning programs in developing countries and Nigeria in particular are still often small, experiential pilot projects with little documented history of their successes and impacts. The building of the physical infrastructure as well as the knowledge infrastructure base such as teacher training, teaching materials and Internet facilities are necessary before the full benefits of the e-learning educational investments can be realized. The development of these



infrastructures is noted to be at low realm in almost all higher institutions in the county. The findings of this paper reveal that the polytechnic is experiencing critical challenges such as poor infrastructure, a lack of teachers and learning material, and poorly prepared students on e-learning.

## 6. Recommendations

Consequent upon these findings of this study above, the following recommendations were made for prospective and effective e-learning to promote and improve the development of e-learning education in Nigerian Polytechnics:

- i. Conferences, workshops and symposium should be organized by the polytechnic to train their staff and enlighten them on the need for e-learning.
- ii. Provision of fully computerized laboratory and classroom in each school of the Polytechnic for e-learning.
- iii. Provision of improved bandwidth/fast internet connectivity and availability of reliable electricity.
- iv. The institution should put in place an effective ICT board that will oversee the implementation of e-learning.
- v. The institution administration should discard the idea of providing for e-learning alone rather, they should go into public and private partnership for funding.
- vi. Lecturers should be trained in appropriate skills in e-learning.
- vii. Power supply should be adequate or improved upon so as to enhance the use of e-learning in polytechnics.
- viii. Government should provide e-learning technologies to Nigerian polytechnics to equip their e-learning centers.
- ix. Government should release money to the polytechnics for adequate funding of e-learning centers.
- x. polytechnics should employ capable computer experts to train Nigerian polytechnics lecturers on how to use e-learning technologies to deliver their lectures.

## References

- Adebosin, W.G. (2004). *Agricultural Education and Empowerment of Youth's for Employment*. A Paper Presented at the 3rd National Conference Organization by Oyo State College of Education, Oyo.
- Ajayi, I.A. and Ayodele, J.B. (2002). *History and Development of Education*. Ado Ekiti. PETOA Educational Publishers.
- Ajayi, K. (2003). Minimum Standards and Accountability in University Education in B.A. Ehezue & U.M.O. Iwobi (Eds.). *Nigerian Academic of Education Proceeding of the 18th Annual Conference*, Port Harcourt; Keynote Address xcix – cx.
- Allen, I.E & Seaman, J.(2003). *Sizing the Opportunity; The Quality and Extent of Online Education in the United States, 2002 and 2003*.
- Wellesley MA: the Sloan Consortium. Bates, A and Poole, G. (2013). *Effective Teaching with Technology in Higher Education*. San Francisco: Jossey-Bass/John Wiley.
- Bhuasiri, W. Xaymoungkhoun. O. Z. Jeung, J.R. & Ciganek, A.P. (2011). *Critical Success Factors for E-learning in Developing Countries: A Comparative Analysis Between ICT Experts and Faculty*. *Computers and Education*, 58, 843-855.
- Daniel, J. (2009). *E-earning for Development: Using Information and Communications Technologies to Bridge the Digital Divide*. Common Wealth Ministers Reference. Henley
- Eke, H.N. (2011). Modeling LIS Students' Intention to Adapt E-learning: A Case from University of Nigeria Nsukka, *Library Philosophy and Practice*. ISSN 1522- 0222.
- Fareo, D.O.(2012). Schooling and Standards in Nigeria Educational System: Challenges and Prospects. *Nigerian Journal of Educational Research and Evaluation*, Vol. 11 , No 12 pages 30-41.
- Farrel, G. & Shafika, I. (2007). *Survey of ICT and Education in Africa: A Summary Report, Based on 53 country surveys*. WashingtonDC: infoDev/WorldBank Available: <http://www.infodiv.org/en/publication .353.html>



- Hedge, N. and Hayward, L. (2004). *Redefining roles. University e-learning contributing to Life-long learning in a networked world. ELearning*, 1:128 – 145 <http://www.nationmaster.com/country/ni/Internet>.
- Cheung, W. & Huang, W. *Proposing a framework to assess Internet usage in university education: An empirical investigation from a student's perspective. British Journal of Educational Technology*, 36(2) 2005, 237-254
- Dawson, S. Online forum discussion interactions as an indicator of student community. *Australasian Journal of Educational Technology*, 22 (4), (2006) 495-510. <http://www.ascilite.org.au/ajet/ajet22/dawson.html>.
- Johnson, E. M., Cowie, B., De Lange, W., Falloon, G., Hight, C. & Khoo, E. (2011). *Adoption of innovative e-learning support for teaching: A multiple case study at the University of Waikato. Australasian Journal of Educational Technology*, 27(3),(2011) 499-513. <http://www.ascilite.org.au/ajet/ajet27/johnson.html>
- Shavinina, L.V. (2001). *A new generation of educational multimedia: High intellectual and creative educational multimedia technologies*. New York: Mary Ann Liberty Publishers.