A Review of E-learning Technologies Adoption in Nigeria’s Tertiary Education Institutions

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Abstracts
This paper reviews the impact of e-learning on education and training in Nigeria’s tertiary educational institutions. Tertiary educational institutions in Nigeria are moving towards the point where technology will be the major medium of its delivery. E-learning emerged in 21st Century as a vital tool for learning and teaching. This paper discuss the impact of e-learning technologies, factors affecting its full adoption such as power shortage, lack of technical manpower and high cost of computer hardware acquisition, mention the prospects of its full implementation to the institutions & recommends the way forward.

Keywords: ICT, websites, E-learning, GSM

Introduction
Cultural economics, and political barriers are been broken down today by globalization. Every facet of the society is currently affected by the change brought about by globalization, especially traditional mode of communications and learning. This current globalization is brought about by the advancement of the Information and Communication Technology (ICT).

The internet, mobile applications and websites are the fastest and most efficient means of communications of 21st century, which networks world into a global village. Internet-based communications can be synchronous or asynchronous which gives them advantage over the traditional methods of communication such as public telephone networks.

People around the world are now required to develop high level of creativity and imaginative skills as well as innovative competencies, to become competitive in the global economy [1]. As ICT becomes more robust and easier to use, it increasingly penetrates academic institutions. The use of technology in education known as e-learning has become standard component in many courses. Technology applications are not limited to only classroom situations but are also replacing some classrooms session contacts virtual contacts or online courses [1]. ICT has become one of the most important means to provide learning resources for students [2]. Learners today are called “Digital Natives” because they have grown from kindergarten to tertiary levels of education using digital technologies such as cell phones, internet games, internet browsing etc [3]. The objective of this paper is to review the trend in the adoption of e-learning technologies in Nigeria’s tertiary institutions.

E-learning
E-learning is a very broad term for electronic method of learning which is closely associated with internet -based learning in general [4]. According to Olugbeko (2013), E-learning education is the wholesome integration of modern telecommunication equipment and ICT resources, particularly the internet, into the system. E-learning is a computer based educational tool or system that enables training or learning to take place anywhere and at anytime [5]. At inception, e-learning was delivered through different blends of computer resources such as CD and DVD but today it delivered mainly through the internet [5]. Chokri (2011) defines E-learning as a concept that includes many applications, process and learning method. E-learning can be defined as the use of internet technologies to assist or to enable online learning/teaching resources and to provide collaborative applications for the learners [2]. E-learning is any machine assisted learning using computer systems whether in a classroom or other locations [6]. E-learning is different from the traditional face to face classroom learning because it is individualized, made up of community of
learners, teachers and experts [6]. E-learning is the use of ICT to enhance knowledge and to improve performance. According to Olojo (2012), E-learning technologies offers learners control over content, pace at learning, sequence of learning and time management which enables them to tailor their experiences to meet their personal learning objectives. E-learning is transforming the role of the teacher to that of a facilitator while it presents faculty with a lot of research opportunities. E-learning is leading to education revolution that will make learning individualized (adaptive learning). E-learning is also known as web based learning, online learning, distributed learning, computer assisted instruction or internet based learning [6]. E-learning provides opportunities for learners to share and distribute learning materials in all kinds of format such as slideshows, videos, pdf, audios and word documents and recently webinars are now added to the lists [5].

Overview of Tertiary Education in Nigeria

According to Jaja (2013), education is the means of acquiring knowledge, skills and other capabilities necessary to survive in life. Education could be formal with expected outcome or informal with unexpected outcome. Tertiary educations refer to the western type of education which is organized after college education [7]. These institutions are formed and governed by rules and regulations from the Ministries of Education. Government, through the Ministries of Education draws up policies for such institution in the area of curriculum, age of the students to be admitted, entry requirement, the kinds of certificate to be issued, qualification of their teachers, conditions of services and the workload for their teachers [7].

In Nigeria, tertiary education is the education given after secondary education and is normally obtained in the Universities, Polytechnics, Colleges of Education, monotechnics, and other institutions offering correspondence courses [8]. There are quality control mechanism such as National Universities Commission (NUC) which is saddled with regulating he Universities while the National Board for Technical Education (NBTE) is saddled with regulating the polytechnics. The aim of tertiary education are:

- To contribute to national development through high-level relevant manpower development.
- To develop and inculcate proper values for the survival of the individual and he society
- To develop he intellectual capability of individual to understand and appreciate the local and external environment.
- To acquire both physical and intellectual skills which will enable individuals to be self-reliant and useful members of the society?
- To promote and encourage scholarship and community services
- To forge and cement national unity and
- To promote national and international understanding and interaction.

There are 152 Universities, 107 polytechnics, 27 monotechnics, 220 colleges in various specific disciplines and 84 teacher training colleges in Nigeria as of March, 2017 [9]. Each of the categories of tertiary education institutions are to equip their graduate with specific skills.

Development of ICT & E-learning Infrastructures in Nigeria

The development of e-learning in Nigeria could be traced back to the development of telecommunication which began in 1886 when the colonial administration linked its Lagos office to London for transmission of information and for feedbacks [10]. This was followed by the linking of all government offices in Lagos with telephone for easy communication in 1893 and consequently linking all over Nigeria together.

Nigeria has witnessed a lot of positive changes and development since 1886. At independence in 1960 with a population of about 40 million people, Nigeria had 18,724 phone lines which translated to tele-density of about 0.5 telephone lines per 1000 persons [11]. In 1999 when President Olusegun Obasanjo came to office he granted licenses to four (4) private Global System for Mobile communication (GSM) companies. With the deregulation of telecommunications in Nigeria and the subsequent licensing of GSM companies, the teledensity of Nigeria telecommunication services which include data and voice is 103.2% [12]. The introduction of third generation (3G) networks came with voice and data and the GSM companies were able to act as Internet Service Providers (ISPs), which hitherto was carried out by Companies selling Very Small Aperture Terminals (VSATs) which were very
expensive and require experts for installation [10]. 3G made it possible to download standard html websites, videos and audios through smart phones and at relatively cheap cost compared with VSAT or dialups [13].

**E-learning in tertiary institutions in Nigeria**

Over the years, institutions of higher education in Nigeria have increasingly invested in course management software to provide a virtual student learning environment designed to improve and help in the delivery of the course itself [14]. Lecturers are always encouraged to look for ways to assist students in their learning skills both within and outside the classroom. Because of the drive to make learning easier for the student many institutions try to make use of the technology available at that time.

The internet technology has made this generation different from the previous generations. Even though communication has been part of human civilization, the introduction of the internet has led to monumental changes in the ways things are done such as e-banking, e-education, e-commerce, e-government etc.

E-learning began in Nigeria’s tertiary started with the storing of prepared lecture materials in CD-ROMs that can be played back later when the need arises [15]. Although this has the advantage of lecture materials been available to students at anytime, it came with the drawbacks of limited number of Computer systems per students and also were not interactive and real time [15]. Adu et al (2013) states that most institutions adopted the intranet in order to improve the delivery of this services but could not maintain the intranet facilities because of high cost of powering the computer systems in the absence of public power supply which normally force the students to go to public internet cafes. This also comes with the challenge of low bandwidths, which made it impossible for the students to stream interactive lectures real time. Despite these earlier drawbacks, some higher institutions of learning such as Obafemi Awolowo University, Ile-Ife and federal school of surveying actually set up e-learning facilities [16]. At Niger Delta University, the availability of the ICT infrastructure is very limited as a result the students are not getting any benefits associated with it [17]. According to Olaniyi (2006), most of the higher institutions of learning in Nigeria are only setting up ICT centers and providing internet facilities without providing other infrastructures that make up e-learning.

**Challenges to E-learning penetration in Nigeria’s tertiary institutions**

Nigeria Universities face a lot of challenges in implementing E-learning. Computer illiteracy, electricity and high cost of purchasing computer system were identified as factors that affected E-learning in tertiary institutions in Nigeria [18]. E-learning places high demand on learners who have to be more proactive and focused in learning than in the traditional brick and mortar learning. According to Resnick (2002) cited in Oye et al (2010), the approaches to learning and teaching must change before technology introduction could be of any benefit to both the learners and the teachers. The major problems of militating against the full implementation as stated in [15] are as follows:

a. High cost of hardware acquisitions  
b. High cost of bandwidth  
c. Shortage of manpower  
d. Poor telecommunication infrastructure  
e. High cost of buying and maintaining e-learning equipment  
f. Unstable power supply  
g. Lack of local digital e-learning software  
h. Fear of technology by both students and lecturers

**Prospects of E-learning technologies to Nigeria’s tertiary educational institutions**

The introduction of e-learning into tertiary education will definitely have many benefits to both the learner and the their trainers. E-learning is a transformative technology which when applied properly could assist in learner centered environment [19]. E-learning will lead to the following advantages if properly implemented by the tertiary educational instructions in Nigeria:

a. Link to remote academic materials: E-learning will provide learners and teachers the opportunities to access all digital softcopies of academic materials without the limitations of distance and time. Internet
today is making bricks and mortar libraries less important in information searching and knowledge sharing. Learners and teachers today could access any remote library in any part of the world.

b. E-learning leads to efficient administration of distance learning: National Open University, which is a full-fledged distance learning university, University of Ibadan and Obafemi Awolowo University operate distance learning centre in some cities in Nigeria where combinations of print, live and recorded broadcast as well as the Internet is used to deliver courses or lectures to their subscribed students [19].

c. E-learning makes collaborative learning possible: Collaborative learning makes it possible for learners to teach one another based on each individual’s experience and situations. With collaborative learning, time and distance constraints are eliminated because every individual can read and contribute to a particular topic at their own time.

6. Conclusion
Developed nations have fully implemented e-learning into their tertiary education for efficient and effective service delivery. African tertiary educational institutions, especially Nigerian institutions are yet to take full advantage of opportunities offered by ICT to both staff and student in learning and research this is because of some fundamental problems such as cost of bandwidth, lack of technical manpower and high cost of computer acquisition.

Recommendation
This paper will recommend the following:

a. Nigeria Government should invest in ICT manpower development and infrastructure.

b. Tertiary educational institutions should invest in alternative and renewal energy sources

c. Institutions should facilitate with teaching staff to provide learning resources in the cloud for timeless access by all involved.

References


