E-Learning and Information and Communication Technology (ICT)

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Abstract: Ours is a world that has continued to enjoy advancements in information and communication technologies. The days when learning was confined to the four walls of the class room seems outgone. Today, learning has moved into the virtual environment that culminated in e-education, e-teaching and e-learning. The prospects of deploying electronic teaching and learning methodologies in our contemporary society come with varied issues and challenges hence this research work. The study was carried out within the framework of technological determinism theory and triangulated research methodology, population of the study of students of national open-university, Enugu study center, majorly product of e-learning. Expectedly, a manageable sample size of 344 was determined using the Wimmer and Dominick online sample calculator. Primary research data were collected using interview, questionnaire and focus group discussions. Collected data were analyzed using descriptive statistics. Evidence from research data shows that ICT and communication engineering have influenced the ease of learning, despite the challenges of e-malpractices and irregularities orchestrated by anonymity engendered. Based on the findings, the researcher concludes that the virtual environment ahead of the physical environment is taking a lead in e-teaching and e-learning activities. Accordingly, it was recommended that ethical practices should be taught to safeguard the integrity of our education infrastructures.

Key words: E-Learning · Education · Communication · Challenges and ICT

INTRODUCTION

The Information and Communication Technologies (ICT) are changing the society and the economy, so it cannot be expected that education and training should not be affected. Through many applications of Information and Communication Technologies that can presently be observed do not substantially change the conventional teaching habits, when technology use is integrated in a broader innovation effort its potential to stimulate, accompany and amplify change is enormous" [1].

The phrase Information and Communication Technology has been used since the 1980s by the academic researchers but became more popular after 1997, after it appeared in a governmental report in the United Kingdom (UK). E-learning systems have their roots in the concept of Computer-assisted instruction [2]. According to [3] computer Assisted instruction" refers to the use of computers to present drills, practice exercises and tutorial sequences to the student and perhaps to engage the student in a dialogue about the substance of the instruction. The concept of computer Assisted instruction appeared for the first time in 1955 as a result of the way of teaching problem solving [4] some definitions of computer-assisted learning and teaching have their focus on contents, others are focused on communication or even on technology [5].

E-learning systems are widely used from academia to industry. The usage of E-learning systems raises new research contexts. Multiple collaborative learning system were implemented to improve people's interaction, communication, working, coordinating activities, socializing and learning. E-learning systems play significant role in the learning activities.

Communication between students and teachers is no longer based in one way communication (classroom teaching) but usually a two way communication. Students interact with teachers, asking for tutoring services and questions on topics, as well as students also

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communicate with their peers. Students have access to technological media that enable them to participate in several groups of knowledge as well as, they have the possibility of creating content to spread their own knowledge as fast as a click. University students typically engage in groups in order to learn and develop work together.

E-education can provide access to the best practices or knowledge available [18]. The process of education using ICTs can be classified into e-learning, blendedlearning and webinar courses. Blended courses refer to the one that combines the class meeting and online meeting while webinar requires synchronous class meeting be held on line through audio/video technologies. This study focused on E-learning and ICT. Initially when E-learning was introduced people were frightened and criticized it but today it is gradually gaining general acceptance not only in the academic field but in other sectors like Medicine, business, government, agriculture, services are adapting the concept of E-learning which helps in the progress of a nation.

Objectives of the Study: The main objective of this study is to examine the role of information and communication technologies in promoting E-learning in Nigeria using NOUN Enugu study center as a case study.

Other objectives include determination of availability of adequate ICTs, ability to use them and difficulties militating against E-learning.

Research Questions: The following research questions were asked to guide the study.
• Do students have difficulties in using ICTs in E-learning program?
• Do online students perform better than offline students with the same resources?
• Does E-learning offer opportunities for students to cheat in Examinations.
• Does frequent interruption of light affect performance of students on E-Examinations?
• Does E-learning enhances students' digital skills and learning experiences?

Literature Review
The Concept of e-Learning: The use of computers and the Internet as teaching applications has grown rapidly in recent times. This is just an example of growing influence of the Internet in our life. While not that long ago sitting in a classroom and listening to the teacher's lecture and making notes on paper used to be the common practice in

learning. Then slowly with the evolution of computers the methods shifted towards more technological ways like the use of PowerPoint slides in the classroom or using pdf files to share notes with the students.

E-learning is extending learning opportunities from a fixed temporal classroom to virtual classroom available anywhere and anytime.

The concept of E-learning is taken from Anglo-Saxon literature.

The term e-learning usually refers to the use of different kind of Information and Communication Technologies (ICTs) and electronic devices in education. According to Oxford Dictionaries, E-learning is defined as learning conducted via electronic media, internet or web technologies.

E-learning is the use of electronic media, educational technology and Information and Communication Technologies (ICT) in education.

It is a broad term for teaching and learning activity that uses any electronic devices or network completely or only partially. E-learning is a change from the traditional education or training system to a more ICT-based personalized and flexible education systems. The learning delivery materials may be inform of text, audio, images, animation and streaming video tutorials and computer programme applications and processes such as audio or video tape, satellite TV, CD-ROM and computer based learning as well as local intranet / extranet and web-based learning. For example, in computer based training. A student learns by executing a special training programme on a computer. Such training materials are usually embedded with the computer applications so that the students can practice using the application as they learn.

Developments in internet and multimedia technologies are the basic enabler of e-learning with five indent key sectors of the e-learning industry: Consulting, content, technologies, services and support. E-learning is suited to distance learning and flexible learning, but it can also be used in conjunction with face-to-face teaching in the classroom.

E-learning is also referred as online- learning, distance learning, virtual education, digital education, web-based learning, internet based learning, computer based training (CBT) or technology enhanced learning depending on emphasis of the delivery method, web based learning or online learning essentially includes learning on line through the courses that are offered on the net. E-mails, live lectures and video conferencing are all possible through the net. This enables all the participants to give their views on a particular topic and

then discuss them further. They also offer static pages like course materials that are printed for the benefit of all the participants. One of the main advantages of accessing pages on the web is that most of the web pages have hyperlinks that will lead you to another page and thus opens up a vast amount of information on the net.

E-learning or web based course would typically include course information, time table, notice board, curriculum map, teaching materials like articles, slides and handouts, communication through discussion boards and email, summative and formative assessments, students management tools like statistics, records and student tracking and also links to external websites that are very useful.

Computers and communications are bringing about a revolution that is making profound changes in our lives, more so in the process of Research. This revolution has gone on under various names: The Computer Revolution, The Information Revolution, The Communication Revolution, The Internet Revolution, The Multimedia Revolution, The Binary Age, The Information Age, The Information Society, The Information Superhighway or "Infobahn" or 1-way or Data way or the all Compassing DigitalAge. [6].

The technological systems and Industries that the computer and communications revolution is bringing forth may seem overwhelmingly complex. However the concept on which they are based is as simple as the flick of a light switched on and off. Information technology is technology that merges computers and high speed communications links carrying data, sound and video [7]. The merger of computer and communications technologies is producing "technological convergence" – the technological coming together of several industries through various devices that exchange information in the electronic format used by computers. The industries include computers, communications, consumer electronics, entertainments and mass media.

The Concept of Information and Communication Technologies (ICTs): Information and communication technology (ICT) is the technology that merges computing with high speed communications links carrying data, sound and video.

Information and Communication Technology is the use of multimedia technologies to communicate information, news or messages to the target audience. The multimedia technologies include the computers, satellites, fax machines, fiber optics, digital networks and

ultimately the internet, information super high way. These multimedia technologies are variously called Information and Communication Technologies (ICTs), New Information Technologies (NITs) which make possible Computer Mediated Communication (CMC) and given rise to information super high way.Multimedia which is the presentation of information using the combination of text, sound, pictures, video and animation cannot be done without computer and internet.

All these have to do with the online world, which William Gibson named "cyberspace".

The Information and Communication Technology (ICT) has revolutionized our society. That is we are at the information age or society where every facet of human endeavor is being computerized or automated.

The computer is rapidly becoming available to many individuals in our society. Computers now play a vital role in almost every facet of our life.

Computers and internet are now used in Education, offices, Banking system, Commerce and Industry. Some of our medical and scientific facilities now depend entirely upon computer based systems. Accounting is also done through computer.

Educational institutions and organizations like Universities and JAMB do computer based examinations; Job advertisements and recruitment are done through internet.

E-learning and ICT which is the focus of this study is done through computer and internet. So the role of ICT in E-learning cannot be overemphasized.

Types of E-Learning: The learning process achieved by using digitally delivered content or interaction is e-learning. Mainly e-learning focuses on the use of computers whether in distance or in a classroom to deliver content to students. With the advancement in technology and the use of the World Wide Web the learning process is not only limited between a teacher and student. Learning can be achieved through reading blogs, participating in online forums, threaded email discussions, social media or through online training platforms such as the code academy.

It is very common for people to use a search engine such as Google to look for information ranging from what to eat to what to wear in a particular day. People consult different blogs or online tutorials to learn about products or particular ways of doing tasks. These all are e-learning processes. Depending on the use of the source or the delivery medium, e-learning can be of different kinds:

- Purely online: no face-to-face meetings
- Blended learning: distance learning or a combination of online and face-to-face
- Synchronous: instructor led online courses
- Asynchronous: self-placed learning methods placed on the internet, network or storage devices.
- Instructor-led group: distance learning where students may be from different geographical locations and learn from a single teacher
- Self-study: learning by visiting blogs, tutorials or informative websites
- Self-study with subject matter expert: learning by regularly visiting some experts blogs or up-to-date sites

- Web based: learning purely by looking up on the Internet with the use of search engines or social media groups such as Facebook
- Computer based: learning by accessing study materials from different storage devices like CD ROM or USB in the computer
- Video/audio tape: learning by accessing multimedia files through YouTube or any other video/audio sharing websites.

Depending on the sue of technological advancement and interactive capabilities of the learning system, e-learning can be divided into three different types as shown in table below.

Type 1	Type 2	Type 3
E-learning systems with low interactive capabilities, which mainly consist of texts or multimedia materials.	E-learning systems with moderate interactive capabilities.	E-learning systems with high interactive capabilities either with student to student or student to teacher or even both.
The examples of this type of systems mainly consist of power point presentations, learning from an e-book or learning from watching videos or audio podcasts.	The examples of this type of systems mainly consist of quizzes with feedback, interactive resources, reflective learning and learning by using simulators or demonstrations.	The examples of this type of system mainly consists or modern blended e-learning systems such as virtual classrooms, video conferencing, streaming medias, different online group games, online blogs, Wikipedia or social media groups.

Merits of e-Learning:

- You are able to link the various resources in several varying formats.
- It is a very efficient way of delivering courses online.
- Due to its convenience and flexibility, the resources are available from any where and at any time.
- Everyone, who are part time students or are working full time, can take advantage of web-based learning.
- Web-based learning promotes active and independent learning.
- As you have access to the net, you can train yourself anytime and from anywhere also.
- It is a very convenient and flexible option; above all, you don't have to depend on anyone for anything.
- Not only can you train yourself on a day to day basis, but also on weekends or whenever you have the free time to. There is no hard and fast rule.
- Through discussion boards and chats, you are able to interact with everyone online and also clear your doubts if any.
- The video instructions that are provided for audio and video learning can be rewound and seen and heard again and again if you do not happen to understand the topic first time around.

Demerits of e-Learning:

- The main demerit is that you get knowledge only on a theoretical basis and when it comes to putting it to use whatever you have learnt, it may be a little different.
- The face-to-face learning experience is missing, which may matter to some of us.
- Most of the online assessments are limited to questions that are only objective in nature.
- There is also the problem of the extent of security of online learning programmes.
- The authenticity of a particular student's work is also a problem as online just about anyone can do a project rather than the actual student itself.
- The assessments that are computer marked generally have a tendency of being only knowledge-based and not necessarily practicality-based.

Empirical Study: Masonand Rennie [8], In a study, pedagogy first: making web, Technologies work for soft skills development in leadership and management education, found out that electronic delivery medium effectiveness has been a long-standing issue and continues to persist.

Moore, Dickson and Galyen [9]. Evaluation of Evidence – Based practices in online learning: A meta-Analysis and Review of online learning studies andMlitwa [10]. The comparative effectiveness of web based and classroom instruction: A meta-analysis, personnel psychology. Suggested that e-learning system outcomes now equal and in some cases surpass those provided in classroom-based settings. E-learning can be a superior mode of instruction if it is targeted to learners with specific learning styles. Mishra and Koehler [11], Sun *et al.* [12]. The determinants of students' perceived learning outcome and satisfaction in university online education: An empirical investigation, decision sciences. Found that all six factors including course structure, self motivation, learning styles, instructor knowledge and facilitation, interaction and instructor feed-back significantly influenced students' satisfaction [13].

Theoretical Framework: This study is anchored on Technological determination theory. This theory was propounded by Marshall McLuhan. The Theory states that the available technology in the society determines the mode of communication [14]. This theory shapes how individual in the society thinks, feels, acts and how society operates as we move from one technological age to another. We learn and feel messages we receive through the current technology that is available [15]. We are in the information or computer age and we are using it in our daily communication.

This study is the role of ICT in E-learning and this theory is appropriate because it will help to focus the study on online communication which is made possible through current communication technology which is computer and internet [16].

Research Design/Data Collection: The researcher used triangulated research method in which data were collected with interview, questionnaire and focus group discussions. The target population of the study was the students of National Open University of Nigeria (NOUN) using Enugu Study Centre as a case study. Out of the population of 2005 in Enugu Study Centre a sample size of 344 was determined using the Wimmer and Dominick online sample calculator [17].

The researcher designed and produced 344 copies of questionnaire which he administered on the sample of the study. Interview schedule was also designed and used where necessary. Focus group discussion was also used to elicit information for the study.

Data Analysis: The data collected for the study were collated and analyzed. 344 copies of questionnaire were distributed, 334 representing 97.09% were returned while 10 representing 2.91% got lost in transit. The researcher therefore used 334 for analysis.

Analysis of Research Questions: In question 1, the respondents were asked whether they have difficulties in using ICTs in E-learning.

335 respondents representing 97.38% stated that they did not have difficulties in using ICTs in E-learning while 9 representing 2.62% had contrary opinion. This means that the students of NOUN have embraced fully the use of ICTs in E-learning.

In question 2, the respondents were asked whether online students perform better than offline students. 338 representing 98.26% replied that online students performed better than offline students while 6 representing 1.74% has contrary idea [18]. This means that student that engaged in E-learning performed better than classroom or face-to-face students.

In question 3, the respondents were asked whether e-learning offers opportunity for cheating during examinations. In their reply 175 representing 50.87% were of the opinion that it offers them opportunity for cheating while 169 representing 49.13% were of the view that it did not offer opportunity for cheating [19].

Look at the magnitude of the respondents, one could state that examination malpractice in E-Examinations is not rampant as obtained in offline examinations.

In question 4, the respondents were asked whether frequent interruption of light affect performance of students in E-Examinations.

In their response, 340, respondents representing 98.84% were of the opinion that frequent interruption of light did affect their Examinations while 4 representing 1.16% said that it did not affect theirexams. This means that frequent light interruption is a serious problem in E-Examinations and frantic efforts should be made to control it.

In question 5, the respondents were asked whether e-learning enhances students' digital skills and learning experiences.

Out of 344 respondents 342 representing 99.42% said it enhanced their digital skills and learning experiences. This means that students that engaged in E-learning are advancing in digital communication.

RESULTS

The followings are the results of the study.

- That student do not have difficulties in using ICTs in E-learning.
- That online students perform better than offline students with the same resources.
- E-learning offers opportunity for students to cheat in Examinations.
- The frequent interruption of light affects student'sperformance in E-Examinations.
- E-learning enhances students' digital skills and learning experiences.
- E-learning is more beneficial to working class.
- Online learning variations of the modules did not affect students learning outcomes significantly.
- Combination of online and face-to-face learning modes is more advantageous to student.

CONCLUSION

Information and Communication Technologies play a vital role in E-learning processes. The business of e-learning is fast growing and at the same time many institutions are creating free online platforms to assist students everywhere.

Technological literacy is one of the required skills in the current knowledge based society and ICT and e-learning have a great impact on the educational processes and systems, researches and learning initiative. Though ICTs have not replaced and will not replace classroom based modes of learning or teaching but is taking a lead in e-learning activities. ICTs can provide greater access for different target learners and have become vehicles for enriched pedagogical experiences particularly for distance educators and learners separated by time and space.

Government should help this system by providing adequate ICT facilities and ensure stable power supply. Also ethical practices should be taught to safeguard the integrity of our education infrastructures.

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