

Assessment of e-Learning System for Effective Teaching and Learning in National Open University of Nigeria (NOUN), Azare Study Centre, Bauchi State

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Abstract

As technology advances, the use of Information and Communication Technology (ICT) tools or gadgetries has proliferated in all areas of human endeavours which paved way for the use of electronic learning (e-learning) system in which teachers are no longer present in the physical classroom to teach their courses. This paper therefore assesses the e-learning system as a mode of teaching and learning process, relevance of its usage and challenges that hinder majority of students in its usage in learning process. This research adopted survey research design where the researchers developed questionnaire known as Questionnaire on Usage of Electronic Learning System (QUELS) was used as an instrument for data collection. The study population consists of 172 students (Male = 133, Female = 39) of National Open University of Nigeria (NOUN), Azare Study Centre. No sample was selected as population is small. The instrument was validated by experts in both fields of Computer Science and Education. The reliability index of the instrument yielded 0.82 using Cronbach alpha. The data obtained were analyzed using descriptive statistics (mean and stand deviation) to answer all research questions while hypotheses were tested using chi-square statistics. The results showed that the use of e-learning system eases learning among the students and since course contents and materials are made available, it makes teaching and learning process be student-centered and gives the students the opportunity for collaborative learning. Challenges such as non-availability of internet services, inability of indigent students to possess portable computer devices, irregular power supply as well as cost of accessing Internet facilities were identified by the students as major obstacles facing studying electronically. In addition to these, it was observed that gender and students' age groups have influence in the usage of e-learning system. Some recommendations, such as provision of portable computer devices at subsidized rate for students, provision of alternative source of power supply and reliable internet facility by the centre, among others were suggested in the study.

Keywords: *e-Learning System, Teaching and Learning, ICT, Challenges, Methodologies, NOUN*

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Background to the Study

Today, the world has revolutionized into an information-driven society which characterized with the use of Information and Communication Technology (ICT) tools as a result of advancement in technology. This new development paved way for the use of electronic learning system (ELS) in our educational realm. ELS is a mode of learning that involves the use of electronic gadgetries, which can be online or offline. It is offline when students are learning on their own without connecting to internet facilities with ICT devices, while the online involves connection to internet and use of learning facilities. In the e-learning system, teacher may adopt any pedagogy while in the classroom, where interactions between teachers and students take place and location of teacher and students do not matter. Nedevea (2005) sees e-learning system as a way to use a variety of computer and networking technologies to access (often geographically remote) training materials, interact with learners, etc, with the learning management system for education.

The electronic learning system makes use of many application software and hardware/devices for its effectiveness by user. The hardware consists of Personal Computers (PCs), Personal Digital Assistants (PDAs), smart mobile phones, to mention but a few. Students make use of PCs to read materials downloaded from learning management systems of the institution to which he or she enrolls. Teachers also make use of PCs to type and organize the lectures for students and the lectures can also be uploaded to learning management system of the institution so that students can access them anywhere and anytime. PDAs and mobile phones work like PCs too; the main difference is that the duo are more portable than either laptop or desktop computers. Commenting on the importance of PDAs, Kim, Mims & Holmes (2006) opined that PDAs help professors to organize their courses and to manage their research materials and information. In addition to this, students use PDAs to write quizzes, to view lecture schedules and to read notes. Similarly, Engel & Green (2011) pointed out that mobile phones and PDAs can be used by teachers to survey students' responses on a given topic, to give them an immediate feedback from their responses and to quickly assess their understanding of a given topic. Cell phones can also be used in a classroom to gather information from internet using tools such as web searches and social networks. In the words of Keegan (2005), students use e-mails and SMSs from their cell phones to exchange information about timetables changes, examinations deadlines and assessments results. E-mail attachments communicated through cell phones may also contain important academic or administrative documents.

Furthermore, some of the application software that can aid students in ELS includes You-Tube, video conferencing and learning management systems. On You-tube social media, different lectures on different topics and subjects available on streaming. With the aid of good and reliable internet connectivity, students can log on and download these course-lectures on their devices and later watch at their own convenience. Relating the use of audio and visual to e-learning system, United Nations Education Scientific and Cultural Organization–UNESCO (2006) asserted that combination of both audio and visual stimuli is more effective than visual stimuli alone in enhancing vocabulary and sentence construction skills and can aid information processing and memory of any student. Besides, through the

use of videoconferencing, remote learners are able to engage with their tutors in interactive tutorials and practicals. Videoconferencing also paves way for remote learners to engage with their peers for group work or discussions; postgraduate research students can use videoconferencing to discuss their research with their supervisors and researchers can present their research findings through videoconferencing in a situation where travelling to a conference is not possible for whatever reasons (Smyth cited in Ntshakala, 2016).

However, learning management system (LMS) is a software application for the administration, documentation, tracking, reporting and delivery of educational courses or training programmes via internet. With this, learners can log on with their details, interact with their e-tutors, download lesson contents or materials and as well check their academic progress at the end of each semester. In the words of Ntshakala (2016), learning management systems (LMSs) are used in education to allow educators and learners to engage in meaningful online teaching and learning activities. There are two types of learning management systems: Open Source learning management systems which are freely available online and proprietary learning management systems, which can be acquired from the market for a fee and are owned by a particular institution as its in-house developed software. Examples of contemporary Open Source learning management systems are Moodle, Sakai, a Tutor, Open Class, Blackboard Course Sites, and Google classroom.

In essence, with the use ELS, education is not restricted gender-wise and age-wise. This implies that, a student can get education without age and gender barriers. With this, a student that can feel discourage as result of age at physical school can now study online without much stress.

Research Objectives

The objectives of this paper are:

- (i) To ascertain whether students of National Open University of Nigeria (NOUN) Azare Study centre have access to e-learning system (ELS);
- (ii) To affirm whether students of NOUN Azare Study centre enjoy the perceived ease of use of ELS; and
- (iii) To identify the challenges associated with the use of ELS among the students of National Open University of Nigeria (NOUN) Azare Study centre.

Research Questions

This study is guided by the following research questions:

- (i) Do the students of National Open University of Nigeria (NOUN) Azare Study centre have access to e-learning system (ELS)?
- (ii) Do the students of NOUN Azare Study centre enjoy the perceived ease of use of ELS?
- (iii) Are there any challenges associated with the use of ELS among the students?

Hypotheses

These hypotheses were formulated to guide this research:

- H₀:** Gender has no influence in the use of e-learning system among the students of National Open University of Nigeria (NOUN), Azare Study Centre.

Ho₂: Students' age groups do not have any influence in the use of e-learning system among students of National Open University of Nigeria (NOUN), Azare Study Centre.

Theoretical Framework

The study adopted Technology Acceptance Model (TAM) which was proposed by Davis in 1989 and it is shown in Figure 1. In the TAM, there are four constructs, namely; perceived usefulness, perceived ease of use, attitude toward usage which is also known as behavioural intention to use and actual system use (Davis 1989). This model is related to this work as follows:

- (1) **First Construct -Perceived Usefulness:** This implies that for any technology that is being produced, there is an associated perceived Usefulness. It is this construct that will entice the user of such technology to acquire and start making use of it.
- (2) **Second Construct-Perceived Ease of Use:** In this construct, it is expected that produced technology devices should be easier in usage. The aim of any produced technology is not achieved if it is complex to use.
- (3) **Third Construct - Attitude Toward Using:** This means that a user may use produced technology or device in either positive or negative way. This construct depends on individual difference.
- (4) **Fourth Construct - Actual System Use:** This is the real usage of the produced technology or device. That is to say putting the exact technology into usage.

The X1, X2 and X3 indicate interactions of the users within the system which can lead to user motivation if it is used appropriately. All these four constructs are also applied to E-learning system.

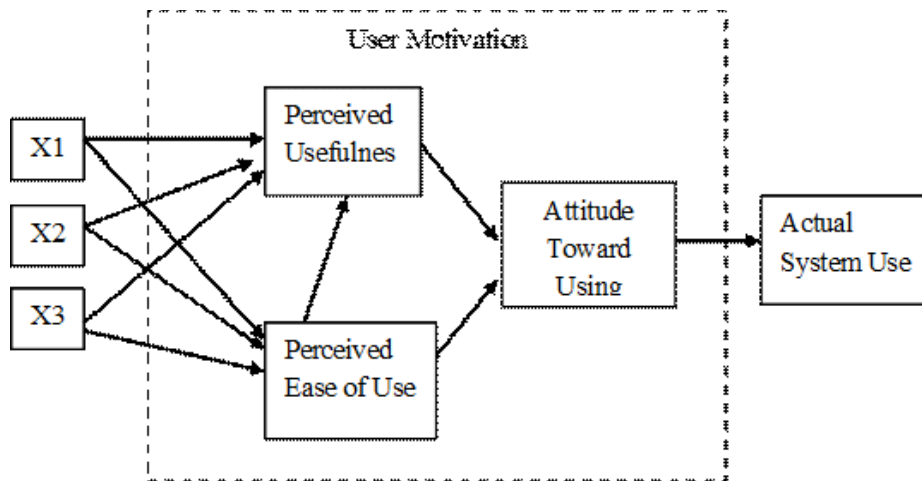


Figure 1: Technology Acceptance Model (TAM). Source: Davis, (1989)

Conceptual Framework

This work is built on the conceptual framework shown in figure 2 below. Electronic Learning System (ELS) as a product of technology adapts to the construct proposed by Davis (1989).

In an ELS, a user needs to gain access to both tools and reliable Internet. Having gained access to Internet connectivity via connected tools and devices, users can then easily make use of perceived usefulness associated with E-learning system, which is actual system use.

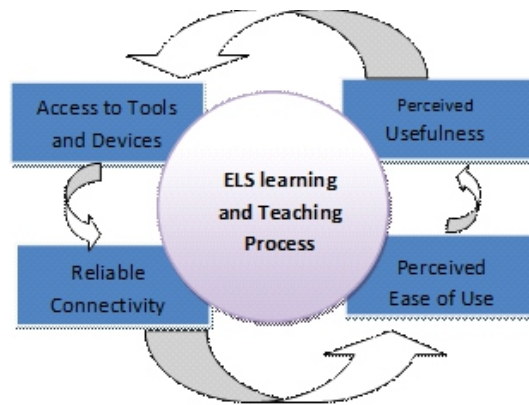


Figure 2: Conceptual Framework of the Research

Research Methodology

This research is a descriptive research of the survey type. The survey involved the use of a researcher-designed questionnaire, known as Questionnaire on Usage of Electronic Learning System (QUELS) to collect necessary information on student. The population for this study comprised all 172 (133 males and 39 female) students in Azare Study Centre of NOUN.

The questionnaire consisted of two sections; A – consists of respondent's age, sex and faculty, while B consists of statements that solicit for respondents' responses on access to ELS; Usage of ELS and Challenges of ELS. The questionnaire items were face-validated by two experts. One was from the field of Measurement and Evaluation while the second was from the Computer Science Education Department of Federal College of Education (Technical), Potiskum, Yobe State. The items were trial-tested to ascertain their consistency among some students of Aminu Saleh College of Education, Azare, Bauchi State and data obtained were analyzed using Crobach alpha test of reliability, which yielded 0.82. In order to ease the work of researchers, two research assistants were employed to assist in questionnaires distribution and retrieval.

Data gathered were analyzed using mean, standard deviation and chi-square statistics. The three research questions were answered using mean and standard deviation while the two hypotheses in the study were tested using chi-square statistics. Questionnaire item statements were set out using five-point scale with Strongly Agree (SA), Agree (A), Strongly Disagree (SD), Disagree (D) and Undecided (U). Their corresponding scales are 4, 3, 2, 1 and 0 respectively. The criteria for agreeing or disagreeing to an item statement are based on calculated mean responses. If the computed mean is equal to or greater than 2, then an item statement is agreed by the respondents, otherwise it is disagreed upon.

Results

Answering of Research Questions

Research Question One: Do the students of National Open University of Nigeria (NOUN) Azare Study centre have access to e-learning system (ELS)?

Table 1: Means and Standard Deviations of Learners' responses on the access to an Electronic Learning System (ELS)

S/N	Item Statement	N = 172	X	SD	Remark
1.	I find ELS readily available at any point in time.		3.74	0.61	Agreed
2.	I easily access the content of my lesson anytime and anywhere when need arises.		3.31	0.66	Agreed
3.	Using ELS simplifies education as I learn while on transit.		3.62	0.69	Agreed
4.	From experience, I find using ELS easy in my studies		3.37	0.58	Agreed

Key: = Mean, SD = Standard Deviation, N = Number of sampled students

Source: Fieldwork 2018

Table 1 presented means and standard deviations of learners' responses on the access to an electronic learning system. As it is indicated in the Table 1, all four item statements that sought for such information were unanimously agreed upon by the students. This is because each of the item statements has computed mean value (3.00 and above) which is greater than the cut-point of 2.00 used in this study. The SD value obtained for each item is low, an indication that respondents' responses were very close to each other. Therefore, it can be inferred that learners access electronic learning system.

Research Question Two: Do the students of NOUN Azare Study centre enjoy the perceived ease of use of ELS?

Table 2: Means and Standard Deviations of Learners' responses on the ease of use of an Electronic Learning System (ELS)

S/N	Item Statement	N = 172	X	SD	Remark
1.	After online interactions with my lecturers, I enjoy studying my lesson privately.		3.13	0.68	Agreed
2.	I download my study materials from the university LMS websites at ease.		3.26	0.51	Agreed
3.	I can ask questions while in the interactive class without feeling being looked down upon by my course-mates.		3.58	0.73	Agreed
4.	I do all my assignments and Teacher Made Tests (TMA) with no stress.		3.31	0.81	Agreed
5.	I enjoy ELS because it supports collaborative studies.		3.41	1.12	Agreed
6.	Using ELS is student-centered rather than teacher-centered.		3.20	0.94	Agreed

Key: X = Mean, SD = Standard Deviation, N = Number of sampled students

Source: Fieldwork 2018

Table 2 depicted means and standard deviations of learners' responses on the usage of electronic learning system. It is indicated that all six item statements that sought for information on usage of ELS were unanimously agreed upon by the students. This is clear from Table 2 that each of the item statements has computed mean value (3.00 and above) which is greater than the cut-point of 2.00 used in this study. The SD value obtained for each item is low, an indication that there were closeness in the respondents' responses. Therefore, it can be deduced that learners make use of electronic learning system easily.

Research Question Three: Are there any challenges associated with the use of ELS among the students of NOUN Azare Study centre?

Table 3: Means and Standard Deviations of Learners' responses on the Challenges of the Electronic Learning System (ELS) Usage

S/N	Item Statement	N = 172	X	SD	Remark
1.	From experience, sometimes, poor internet access causes frustration in my study		3.69	0.58	Agreed
2.	Lack of portable computer devices makes electronic learning difficult.		3.53	0.57	Agreed
3.	Incessant of electricity supply makes study on electronic device a problem.		3.74	0.51	Agreed
4.	Cost of purchase of data bundles and internet subscriptions is a challenge for me in studying on ELS.		3.67	0.84	Agreed

Key: X = Mean, SD = Standard Deviation, N = Number of sampled students

Source: *Fieldwork 2018*

Table 3 presented means and standard deviations of learners' responses on the challenges of using electronic learning system. It is evident that the four item statements that sought for such information on the challenges of using ELS were unanimously agreed upon by the students. This is clear from Table 3 that each of the item statements has computed mean value (3.00 and above) which is greater than the cut-point of 2.00 used in this study. The SD value obtained for each item is lower, an indication that respondents' responses were very close to each other. Therefore, it can be concluded that learners face problems such as poor internet access, lack of portable computer devices, incessant of electricity supply and cost of purchasing internet data bundle. All these affect students' learning styles as they limit what students can learn online.

Testing of Hypotheses

Ho₁: Gender has no influence in the use of e-learning system among the students of National Open University of Nigeria (NOUN), Azare Study Centre.

Table 4: Chi-square Analysis of Learners' Responses on the Usage of an Electronic Learning System (ELS) in relation to Gender

Gender	Learners' Responses on Usage of Electronic Learning System (ELS)			Total	p-value	α	χ ² Cal.	χ ² Cri.	Remark
	Agreed	Disagree	Undecided						
Male	127(73.8%)	6(3.5%)	0(0%)	133(77.3%)	0.001	0.05	77.35	5.99	S
Female	31(18.0%)	8(4.7%)	0(0%)	39(22.7%)					
Total	158(91.8%)	14(9.9%)	0(0%)	172(100%)					

Key: α = Significance level at 2 degree of freedom (df), ²Cal = calculated chi-square value, ²Cri.= chi-square value from table, S = significant

Table 4 above showed the calculated chi-square = 77.35, p-value = 0.001, critical chi-square value = 5.99, at 2 degree of freedom with level of significance () = 0.05. Since calculated chi-square = 77.35 is greater than the critical chi-square value = 5.99 and the P value = 0.001 is less than level of significance () = 0.05, the null hypothesis which states that gender has no significant influence in the use of e-learning system among students of National Open University of Nigeria (NOUN), Azare Study Centre was rejected. This shows that gender has significant influence in the mode of e-learning system among students of National Open University of Nigeria (NOUN), Azare Study Centre.

Ho₂: Students' age groups do not have influence in the use of e-learning system among the students of National Open University of Nigeria (NOUN), Azare Study Centre.

Table 5: Chi-square Analysis of Learners' Responses on the Usage of an Electronic Learning System (ELS) in relation to Age Groups

Age Group (Years)	Learners' Responses on Usage of Electronic Learning System (ELS)			Total	p-value	α	χ ² Cal.	χ ² Cri.	Remark
	Agreed	Disagree	Undecided						
15-24	22(12.8%)	5(2.9%)	0(0%)	27(15.7%)	0.005	0.05	48.13	9.49	S
25-34	121(70.4%)	9(5.2%)	0(0%)	130(75.6%)					
35 & Above	15(8.7%)	0(0%)	0(0%)	15(18.7%)					
Total	158(91.7%)	14(8.1%)	0(0%)	172(100%)					

Key: α = Significance level at 2 degree of freedom, ²Cal = calculated chi-square value, ²Cri.= chi-square value from table, S = significant

Table 5 above depicted calculated chi-square = 48.13, p-value = 0.005, critical chi-square value = 9.49, at 4 degree of freedom with level of significance () = 0.05. Since calculated chi-square = 48.13 is greater than the critical chi-square value = 9.49 and the p-value = 0.005 is less than level of significance () = 0.05, the null hypothesis which states that students' age groups do not have significant influence in the use of e-learning system among the students of National Open University of Nigeria (NOUN), Azare Study Centre was rejected. This implies that the age groups of students have significant influence in the mode of e-learning system usage among students of National Open University of Nigeria (NOUN).

Summary of Research Findings

This paper established the following:

- (i) Learners have access to ELS;
- (ii) Learners make use of ELS;
- (iii) However, learners encounter some challenges in the process of using ELS, such as: electricity problem, lack of portable computer devices, poor internet access and cost of purchasing data bundles;
- (iv) Students' gender has significant influence on the use of electronic learning system; and
- (v) Students' age groups also have significant influence on the use of electronic learning system.

Discussion of Findings

This study found out that learners of National Open University of Nigeria, Azare study centre have access to the e-learning system. The finding is in line with Ardito, Costabile, DeMarsico, Lanzilotti, Levialdi, Roselli & Rossano (2006) who emphasized in a paper that ensuring usability and accessibility to the largest number of users should be one of the main goals of e-learning application developers, as well as a prerequisite that should allow users to profitably exploit such applications.

Besides, this study found out that learners make use of E-Learning System effectively (learn at own pace and convenient time) which is in consonance with the findings of Irina, Irina & Elvina (2016) which gave comprehensive survey that showed the attitude of the students to practical use of distance learning which came out as neutrally-positive. Most students evaluate distance learning at Kazan Federal University as effective. The finding is also in support of findings of Shute & Towle (2003) which concluded that the potential payoffs of designing, developing, and employing good e-learning solutions are great, and include improved efficiency, effectiveness, and enjoyment of the learning experience.

The result of this study also showed that some of the challenges in the process of using ELS are electricity problem, lack of portable computer devices, poor internet access and cost of purchasing data bundles. This finding is also in agreement with the findings of Adesanya (2014), Cole & Dipeolu (2014), Ohwofasa & Elesho (2014), Jimoh & Olabode (2014) and Jimoh & Salawu (2011) which stated that ICT phobia among students and teachers, poor ICT infrastructure facilities, finance and inadequate power supply were major problems that confronted the use of ICT in teaching and learning process.

In this study, it was also discovered that students' gender has significant influence on the use of electronic learning system and this is in disagreement with the finding of Irina, Irina and Elvina (2016) which states that both gender and school system have nothing to do with students' satisfaction while using electronic education.

Finally, this study found out that students' age group have influence significantly on the use of e-learning system which is in line with the research finding of Bakkabulindi, Sekabembe, Shopi, & Kiyingi (n.d) that age affects the use of computers, that is to say there was a significant

inverse relationship between age and the use of computers. Also, Adil, A. , Masood, M. & Ahmed, M. (2013) revealed that there was moderate negative association between level of age and quantity of daily time spent on computer which in support of this finding.

Conclusion

The study investigated the assessment of e-learning system for effective teaching and learning process in National Open University of Nigeria (NOUN), Azare study centre. Issues as regards accessibility to the services provided by e-learning, its ease of use as well as challenges that served as barrier or obstacle in its usage were explored. Based on the findings, some recommendations were given so as to improve the use of e-learning system among students and teachers.

Recommendations

Based on the findings in this study, the following recommendations were proffered:

- (i) There is need to provide alternative power supply means such as solar power system / provision of generating set for the National Open University of Nigeria (NOUN), Azare study centre;
- (ii) Procurement of portable laptops or PDAs to ease mobile studying by students. This can be acquired by the government and sell to the students at subsidized amount.
- (iii) Procurement and installation of globally-approved internet infrastructure in the NOUN Azare study centre to enable students and teachers have access to internet facility at their will.

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