

Utilization of E-Learning Technology by Physics Lecturers in Colleges of Education in North West Region of Nigeria

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Abstract

The study examined the extent of utilization of e-learning technology by physics lecturers in Colleges of Education in North-Western Nigeria. The study adopted a survey research design. A sample of one hundred and thirty (130) physics lecturers drawn from five federal, five state and five private Colleges of Education in the North West region were used for the study. A structured questionnaire was used for data collection. The instrument was face validated by experts. The reliability co-efficient of the instrument was 0.86 using the Cronbach alpha reliability test. Research questions were answered using mean and standard deviation, and hypotheses were tested at a 0.05 level of significance using t-test and ANOVA. Among the study's findings is that the extent of utilization of e-learning technologies among physics lecturers is low. The study concluded that there was low utilization of e-learning technologies by physics lecturers in Colleges of Education in North-Western Nigeria and recommendations were made including the need to create awareness on the importance of e-learning technologies by government at all levels in order to ensure full integration and implementation of e-learning.

Keywords: Utilization, E-learning Technologies, Physics lecturers, Colleges of Education, North-West Nigeria

Introduction

Integrating information and communication technologies into education has revolutionized and transformed the education sector world wide and created impacts provided that successful implementation strategies are followed (Intel in Kass & Balunywa, 2013). E-learning (electronic learning) is defined by Organisation for Economic Cooperation and Development (OECD; 2011) as the use of Information and Communication Technology (ICT) in learning which covers a wide range of the system, from students using e-learning and accessing work online while following a course on campus to programmes offered entirely online. Eke (2011).stated that e-learning takes various forms; web-based, computer-based, virtual classrooms and content delivery via e-network, audio or video tape, satellite TV, video conferencing, CD-ROM, i-pods, emails, wireless and mobile technology among others. E-

learning is also an innovative approach for delivering electronically mediated, well- designed, learner- centred teaching and providing an interactive learning environment to anyone, at any place and anytime by utilizing the internet and digital technologies concerned with instructional design principles (Hedge & Hayward, 2004).

Using information and communication technologies (ICTs) for e-learning leads to various educational opportunities that help physics and other science students develop skills essential for their countries (Intel, in Kasse & Balunywa, 2013). E-learning also provides physics and other science teachers some of the following: increased accessibility to information, better content delivery, personalized instruction, content standardization, accountability, on-demand availability, self-pace, interactivity, confidence and increased convenience (Bhuasiri, Xaymoungkhoun, Jang & Ciganek, 2012). In developing countries, e-learning is still in its infancy and early adoption stage, and these countries experience challenges unique to them (Bhuasiri et al., 2012). They further maintained that there is considerable effort to implement e-learning in such countries.

Incorporating of e-learning into science education has the teaching approach from teacher centred to learner –centred instructional delivery. Therefore, this implies that physics teachers no longer decides what is to be learned, instead, the learners determines how to construct learning based on their interests. E-learning is therefore a learner controlled, self-paced, individualized education environment where the learner has authority over the learning environment and under the teachers' guidance.

The National Policy on Education (2020), recognizes the place of e-learning in achieving lifelong education and affirms that lifelong education shall be the basis of the nation's education policies. The author further stated that the policy goals of e-teaching and e-learning educational systems are to:

1. Provide access to quality education and equity in educational opportunities for those who otherwise would have been denied.
2. Meet the special needs of employers by mounting special certificate courses for their employees at their workplace.
3. Encourage internationalization especially in the tertiary education curriculum.
4. Ameliorate the effect of internal and external brain drain in the tertiary institution by utilizing experts as teachers regardless of their location or work place.

There is therefore the need for careful consideration of how to make the best use of the teaching possibility in the internet environment. It is not about creating a large amount of

content but designing and creating different learning opportunities and experiences (Roseberg, 2011). There will be content online but it should be embedded in a teaching and learning framework that is flexible and acceptable in terms of design. The content is not the primary thing. It is the activity around the content that is paramount. The tertiary institutions that offer teacher education, both pre-service and graduate education, need to consider their changing roles and how they model good e-teaching practices. For teacher educators in tertiary education institutions to talk about what e-teaching might be like without actually doing it, will leave their students wondering why it might be so difficult. What could be even more discouraging for the students is for the institution to put courses online and assume that this is e-learning. The Web-based Education Commission (2000) warned that if teacher education programmes do not address this issue, we will soon lose the opportunity to enhance the performance of the whole generation of new teachers, and the students they teach. Trying to teach in the same old ways but simply utilizing some technologies and calling it e-learning is like using old wine in a new bottle syndrome (Lankshear & Bigum, 1999).

The pace of development and utilization of e-learning technologies and applications for educational purposes, including teaching and learning in developing countries like Nigeria is still very low (Agboeze, Ugwoke & Onu, 2012). Also, the study of Ininje, Utoware and Kren-Ikidi (2013) revealed that e-learning technologies such as e-lectures, e-examination, e-drill, e-book and e-library among others are available for use in instructional delivery; however, they are not extensively utilized in the Colleges of Education.

In Colleges of Education, physics and technology courses are offered. For the product of physics and technology to maintain technological leadership, they must be equipped with technological competencies to meet the tremendous surge and demands of the ever-changing technologies in the world of work.

In Nigeria, institutions of learning are owned and run by the Federal and State government and Private individuals or groups/organizations. Research evidence revealed that as learning institutions are differently owned, the distribution of material and non-material resources varies. This assertion agrees with the study of Ezeugbor, (2008) who maintained that the ICT competence level of teachers varies across institutions and their ownership.

School location refers to where an institution is situated. The school's location may be either in a rural or urban area. National Policy on Education (NPE, 2020) emphasized equal educational opportunities for all regardless of location. However, Olinya (2007) noted that rural and urban schools are not treated equally regarding their teachers and students.

The survey by Akuchie in Ininje, Utoware and Kren-Ikidi, (2013) in five universities in the North Central zone of Nigeria, revealed that lecturers and students are not literate in most

areas of information and communication technologies (ICTs). E-learning facilities are not available in universities and where they exist, they are not functional for teaching and learning. Therefore, there is a need to assess the utilization of e-learning technologies by physics educators in Colleges of Education in North Western Nigeria and concerning ownership and location.

Statement of the Problem

The changes in the skills required for survival in the workplace have led to a paradigm shift from teacher centredness to learner centredness through subject-centredness. The implication is that the teacher can no longer decide what is to be learned. Instead, the student decides and constructs learning in the desired way. Effective e-learning leads to various educational opportunities which help students develop skills essential for their survival. E-learning is a learner-controlled, self paced education that transforms how, when and where learners learn. This study investigated the extent of utilization of e-learning technologies by physics educator in Colleges of Education in NorthWest Nigeria.

Purpose of the Study

This study examined:

1. The extent of utilization of e-learning technologies by physics lecturers in Colleges of Education in North West Nigeria.
2. The impact of ownership and location of College of Education on the utilization of e-learning technologies by physics lecturers in Colleges of Education in North West Nigeria.

Research Questions

Two research questions were raised to guide this study.

1. To what extent is e-learning technologies utilized by physics lecturers in rural and urban Colleges of Education in North West Nigeria?
2. To what extent is e-learning technologies utilized by physics lecturers in Federal, state and private Colleges of Education in North West Nigeria?

Null Hypotheses

Two research hypotheses were raised to guide this study and were tested at 0.05 level of significance.

- H₀₁:** There is no significant difference in the mean ratings of e-learning utilization by physics lecturers in urban and rural Colleges of Education in North West part of Nigeria.
- H₀₂:** There is no significant difference in the mean rating of e-learning utilization by physics lecturers in Federal, State and Private Colleges of Education in North West Nigeria.

Methodology

The study adopted a descriptive research design in order to elicit information on the utilization of e-learning by physics lecturers in Colleges of Education in the North West Nigeria. The study population consisted of all physics lecturers in Federal, State and Private Colleges of Education within North West Nigeria comprising Kano, Kaduna, Jigawa, Zamfara, Sokoto and Katsina. There were 242 Physics lecturers in the twenty-five (25) Colleges of Education in North West Nigeria. The study sample consisted of 130 physics lecturers selected from five Federal, five State and five Private Colleges of Education in the study area. The sampling technique employed was multistage. Stage one purposively sampled the three states covered – Kano, Kaduna and Jigawa states from the region. Stage two was purposive sampling of Colleges of Education within the sampled states. The sampled Colleges of Education were purposively sampled because not all the Colleges of Education offer Physics as a course. The last stage was random sampling of one hundred and thirty (130) respondents representing 54% of the entire population from the selected Colleges of Education.

Data collection instrument was a 13-item structured questionnaire developed by the researcher. The instrument was organized using four Likert-type rating scale - Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE). The instrument was validated by three experts who went through the instrument and make necessary corrections. The reliability of the instrument was ascertained by administering the instrument on physics lecturers who were not from the study area twice at a three weeks interval. A coefficient of 0.87 was obtained when the result obtained was analyzed using Cronbach alpha and reliability statistic. Mean and standard deviations were used to answer the research questions while t - test and ANOVA were used to test the hypotheses at 0.05 level of significance.

Nominal values assigned to scaling items were used to determine the mean. The computation gives $(4+3+2+1)/4 = 2.5$. The decision rule was that, mean scores of 2.5 and above were regarded as high extent while questionnaire items with mean scores below 2.5 were regarded as low extent. Also, reject H_0 if the p-value is less than 0.05 level of significance. Otherwise, retain H_0 if the p-value is greater than 0.05 level of significance.

Results

Research Question 1: To what extent are e-learning technologies utilized by physics lecturers in rural and urban Colleges of Education in North West Nigeria?

Table 1: Mean Rating and Standard Deviation of Respondents on E-learning Utilization

S/N	E-learning technology utilization in teaching	Mean	Std Rural	Rem	Mean	Std Urban	Re m
1	Use of computer to generate lesson Plan	2.35	0.79	LE	1.93	0.82	LE
2	Use of power point presentation	1.96	0.83	LE	1.79	0.84	LE
3	Use of electronic board (smart or clever)	1.87	0.78	LE	1.71	0.73	LE
4	Use of multimedia projector in the Classroom	1.86	0.78	LE	1.65	0.64	LE
5	Use of internet in the class room	1.90	0.80	LE	1.75	0.81	LE
6	Use of electronic text books (e books)	1.87	0.80	LE	1.73	0.82	LE
7	Use of lecturers' guide on learning	1.97	0.85	LE	1.82	0.84	LE
8	Use of internet for research	2.07	0.77	LE	1.69	0.68	LE
9	Use of internet in the library (e-library)	1.78	0.74	LE	1.57	0.67	LE
10	Using computer for record keeping	1.87	0.79	LE	1.72	0.75	LE
11	Evaluating students learning from computer based activities	1.86	0.89	LE	1.88	0.94	LE
12	Structuring subject programmes and lessons to incorporate e-Learning	1.86	0.76	LE	1.64	0.69	LE
13	Use of internet for video/tele Conferencing	1.97	0.84	LE	1.92	0.96	LE
		Mean of means = 1.94		Mean of means = 1.75			

Result in Table 1 reveals that all the items on e-learning utilization in the classroom in rural and urban Colleges of Education were of low extent as the mean of means of the items were 1.94 and 1.75 respectively. This outcome implies that the utilization of e-learning technologies in both urban and rural Colleges of Education in the zone under study was of low extent as no single item in the table is of high extent. However, lecturers in urban Colleges of

Education (mean of means = 1.94) utilizes e-learning more than their counterparts in rural areas (mean of means = 1.75).

Research Question 2: To what extent are e-learning technologies utilized by physics lecturers in Federal, State and Private Colleges of Education in North West Nigeria?

Table 2: Means and Standard Deviation of Respondents on E-Learning Technologies in the Classroom

S/N	E-Lea ruing Technologies Utilization in Teaching Physics	Federal			State			Priv ate		
		\bar{X}	SD	Rem	\bar{X}	SD	Rem	\bar{X}	SD	Rem
1	Use of computer to generate lesson plan	2.09	0.89	LE	2.17	0.76	LE	2.16	0.79	LE
2	Use of power point presentation	1.89	0.87	LE	1.86	0.78	LE	2.07	0.89	LE
3	Use of electronic board (smart or clever)	1.84	0.84	LE	1.76	0.67	LE	1.92	0.80	LE
4	Use of multimedia projector in the classroom	1.79	0.80	LE	1.75	0.65	LE	1.85	0.78	LE
5	Use of internet in the class room	1.84	0.87	LE	1.81	0.74	LE	1.95	0.85	LE
6	Use of electronic text books (e books)	1.81	0.86	LE	1.78	0.74	LE	1.95	0.88	LE
7	Use of lecturers' guide on learning	1.92	0.89	LE	1.85	0.78	LE	1.92	0.78	LE
8	Use of internet for research	2.18	0.82	LE	2.17	0.65	LE	1.11	0.92	LE
9	Use of internet in the library (e-library)	1.73	0.78	LE	1.67	0.67	LE	1.73	0.73	LE
10	Using computer for record keeping	1.83	0.81	LE	1.77	0.74	LE	1.95	0.85	LE

11	Evaluating students learning from computer based activities	1.99	0.92	LE	1.95	0.88	LE	1.81	0.86	LE
12	Structuring subject programmes and lessons to J incorporate e-learning	1.79	0.79	LE	1.75	0.68	LE	1.90	0.79	LE
13	Use of internet for video/teleconferencing	1.95	0.91	LE	1.96	0.88	LE	1.73	0.90	LE

Mean of means = 1.89 Mean of means = 1.87 Mean of means = 1.85

Table 2 shows that respondents' mean rating and standard deviation in federal, state and private Colleges of Education within North West Nigeria were of low extent. All the mean ratings in each case were below 2.5. The result also revealed that lecturers in Federal Colleges of Education utilizes e-learning technologies most (mean of means =1.89) while their counterpart in Private Colleges of Education utilizes e-learning technologies the least (mean of means =1.85).

Test of Hypotheses

H₀₁: There is no significant difference in the mean rating of e-learning technologies utilization by PHYSICS lecturers in urban and rural colleges of Education within North West Nigeria.

Table 3: t - test Analysis of Mean Ratings and Standard Deviation of Respondents on E-learning Utilization in Physics course

Source	\bar{X}	SD	N	Df	t -value	Decision
Urban	25.09	10.14	84	128	1.99	NS
Rural	22.80	10.19	46			

The t-value of 1.99 is greater than 0.05 level of significance. Therefore, the null hypothesis which stated that there is no significant difference in the mean rating of e-learning technologies utilization by physics lecturers in urban and rural colleges of Education within North West Nigeria.is not rejected.

H₀₂: There is no significant difference in the mean rating of e-learning technologies by Physics lecturers in Federal, State and Private Colleges of Education within North West Nigeria.

Table 4: ANOVA of Mean Ratings and Standard Deviation of Respondents on E-learning Utilization by College Ownership

Ownership	X	Std	N	df	sum of square	Means of square	F value	Sig.
Federal	24.66	11.05	52					
State	24.25	9.62	43	2	244.30	122.150	1.586	0.207
Private	21.60	10.82	35					

Table 4 shows that a non-significant outcome $F_{(2,)} = 1.586$, $p > 0.05$ level of significance. Therefore, the null hypothesis is retained. This result means no significant difference in mean ratings of e-learning technologies utilization by physics lecturers in Federal, State and Private Colleges of Education within North West Nigeria.

Discussions of Findings

It was found that Physics lecturers in urban and rural Colleges of Education had low utilization of e-learning technologies in North West Nigeria.

Also, physics lecturers in Federal, State and Private Colleges of Education had low utilization of e-learning technologies in North West part of Nigeria. Generally, e-learning utilization in Colleges of Education in North West Nigeria is low. This finding agree with a survey by Akuchie (2008) in Inije, Utoware and KrenKidi (2013) who found that lecturers and students are not literate in the use of e-learning technologies. The study also agrees with Agboeze, Ugwoke & Onu, (2012) who found that Nigeria's pace of development and utilization of e-learning technologies is low. This result portends an ugly situation as Nigerian Colleges of Education lecturers do not utilize e-learning technologies in the classroom. Teacher Education institutions need to address this issue, or else we will soon lose the opportunity to enhance the performance of a whole generation of new teachers and students.

This study also revealed that the e-learning utilization by physics lecturers in urban and rural Colleges of Education is not significantly different. However, lecturers in urban Colleges of education are slightly better than their counterparts in rural area in terms of utilization of e-learning technologies. This might be due to better accessibility to modern technologies which favour urban areas. Also, physics lecturers in Federal, State and Private Colleges of Education within North West Nigeria are not significantly different in their utilization of technologies. However, in terms of ownership, Federal Colleges of Education lecturers utilizes e-learning technologies than their counterparts in State and Private Colleges of Education. This observation might be due to better funding and supervision by the federal government. In all,

there is a general need to make the best use of e-learning technologies available in the internet environment, if Nigerian Colleges of Education are to join in the information and communication revolution.

Conclusion

Based on the findings of the study, the following conclusion was drawn: e-learning technology utilization by physics lecturers in Colleges of Education within North West Nigeria is low. E-learning technology utilization by physics lecturers in rural Colleges of Education in North West Nigeria is slightly, but not significantly different from their counterpart in urban areas. Also, the level of utilization of e-learning technologies by physics lecturers in Federal, State and Private Colleges of Education in the North West Nigeria is not significantly different from one another.

Recommendations

1. Colleges of Education Managements should help organize long-term and short-term intensive training and monitoring to ensure that lecturers optimally utilize available e-learning technologies irrespective of location and ownership.
2. Governments should help provide funds for lecturers in Colleges of Education to enable them undergo professional training in e-learning.
3. There is a need to create awareness on the importance of e-learning by the government at all levels to ensure full integration and implementation of e-learning.

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