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THE USE OF E-LEARNING TECHNOLOGIES AS A WAY OF IMPROVING TEACHING IN TERTIARY INSTITUTIONS IN SOKOTO STATE

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Abstract

The key challenge in the tertiary institutions is the design of educational policies that respond effectively to the requirements and needs of a changing environment. They must review and continuously improve the utilization of technologies, since these technologies are more and more becoming the means for achieving strategic objectives of the institutions. This study was carried out to determine the utilization of e-learning technologies for improving teaching and learning in Tertiary institutions in Sokoto State. In carrying out the study, it was found that e-learning technologies such as internet and web browser, Interactive whiteboard, Compact disk, multi-media projector, power point, computers, smart phones, among others are highly utilized by both lecturers and students in the institutions, while Learning Management System, digital library, computer simulations, electronic books, video/teleconference are utilized to a low extent by both lecturers and students. E-learning has come to stay under the preview of Computer Science and the only option is to fully embrace it because with the information technological breakthrough in the 21st century, e-learning technologies have become valuable tools for teaching, learning and research.

Keyword: E-Learning, tertiary institutions, technology, management, utilize

1.0 Introduction

Most countries are paying particular attention to knowledge and information as the essential keys to promoting their productivity, ability to compete, and wealth (Escueta et al., 2017). The development of human capital, it is necessary to observe schools and universities to see if they are advancing on a par with the rapidly changing world (Hamidi et al., 2011). The current literature pays considerable attention to the ever-increasing proliferation of technology in higher education (Ignatyeva, 2015). The consensus seems to be that the global digital agenda highlights the need for a change in educational institutions' pedagogical model to meet the demands of the new knowledge to society. Such a change would aim to achieve greater flexibility and to adopt learning technologies to modernize and improve teaching processes and learning in formal contexts in the tertiary institutions (Chais, Ganzer & Munhoz, 2017). Information and Communication Technologies (henceforth ICTs) have had a significant impact on the pedagogy of learning in schools and vocational training (Azma, 2011). ICTs include gathering, organizing, and using the information in various forms, including sound, images, and text, through the use of computers or other derivatives of telecommunications (Hamidi et al., 2011). The decrease in the cost of access to technologies and the ease of connecting to the Internet have overcome some of the barriers to the adoption of ICTs by all the actors in education and have opened up new possibilities and areas of interest (Avello & Duart, 2016). With these facilities, digital technology makes information content easier to find, access, and manage. Each of these steps is central to teaching and learning. Together, they constitute a dynamic digital learning process (Alekseevich & Borisovna, 2014). The use of technology in education has allowed students to access information outside of classrooms, and this has caused an increase in self-motivation for learning. For example, Azma (2011) found that educational technology helps students significantly improve their scores by expanding the information they can access and, as a result, to broaden their learning environment (Personal Learning Environment). Also, the use of technology has also made education more dynamic and exciting. In particular, studies have shown that tweets are considered a more interactive form of learning compared to traditional knowledge-transfer tools such as lectures (Menkhoff, Chay, Bengtsson, Woodard & Gan, 2015). Technology has also allowed the development of collaborative learning and greater participation by students. Collaborative learning implies a greater involvement of the classroom community in the learning on a specific topic (Shi, 2016).

The application of ICT in education has given rise to a new set of vocabularies used to describe new approaches to learning and curriculum delivery. Such terms include - teaching and e-learning, among others which are facilitated via the internet. The availability of the internet provides the channel for the use of electronic approach in education known as electronic learning or e-learning. Simply put, e-learning is the process of teaching and learning using the computer via the internet. It involves passing structured instructional materials from an instructor (lecturer) to a learner (student) through the use of ICTs. E-learning also refers to computer-enhanced training as opposed to the computer-based training of the 1980s (Yahaya, Bawa., 2022).

1.2 Objectives of the Study

The objective of this study was to assess the utilization of e-learning technologies as a way of improving teaching and in Tertiary institutions in Sokoto State. Specifically, the study aims to determine the;

1. Assess the utilization of e-learning technologies by lecturers for improving teaching

and learning
2. Assess of utilization of e-learning technologies by students for improving teaching and learning of Computer Science program in Tertiary institutions.
3. Utilization of e-learning technologies for improving teaching in Tertiary institutions.

Research Questions

The study answered the following research questions:

1. What are the e-learning technologies utilized for improving teaching and learning in Tertiary institutions in Sokoto State?
2. What is the extent of utilization of e-learning technologies by lecturers for improving teaching in Tertiary institutions?
3. What is the extent of utilization of e-learning technologies by students for improving teaching in Tertiary institutions?

2.0 What is educational technology, and what are its tools

The term educational technology applied to the university should be understood as a project encompassing the educational process, involving not only the teacher or the structural divisions of the university but also the students and how they apply technology to improve their learning process (Pachler, Cook & Bachmair, 2010). Educational technologies include information technologies, research technologies for scientific and educational information; technologies for the computer processing of educational information; technologies for organizing the professional training of students; and technologies for the execution and defense of the graduation project or academic works (Ignatyeva, 2015). The most used tools in this new educational era are multimedia technology, online learning or e-learning, mobile learning or m-learning, blogs, and social networks (Fojtik, 2014). On the one hand, multimedia technology allows the integration of text, numbers, graphics, still or moving images, presentations, a high level of interactivity and, besides, the possibilities of navigating through different documents, which gives students the convenience of understanding words and teaching objects (Chen et al., 2012). It has been shown that multimedia technology has four advantages: 1) it improves information reception and the quality of teaching; 2) it deepens students' memory and their understanding of knowledge through vivid images, videos and refined language, 3) the application of multimedia technology can unite the process of recognition and the affective process; and 4) it can stimulate and motivate study among groups of students and improve the efficiency and the quality of teaching (Ausin, Abella, Delgado & Hortiguela, 2016). On the issue of improving the quality of teaching, although there is a universal notion that educational technology promotes improvements in learning, these improvements are challenging to measure at present. Thus, an unexplored field is precisely how and to what extent ICTs affect higher education and how these technologies may lead to different careers.

2.1 Skills required by the student to make use of technological education

Broad consensus was that students can facilitate their learning process with the help of technology without limitations of time and place because, in such a setting, they can easily collect and analyze data, test hypotheses, design experiments, and conclude (Mahini, Forushan & Haghani, 2012). However, although many universities recognize the need to innovate along these lines, there is no decisive leadership for students to follow in order to address the required

changes themselves (Casas & Stojanovic, 2013). In higher education, it is essential to emphasize that there are pure or exact science careers that have already been adapted to today's technology. However, some careers have not fully incorporated ICTs and taken advantage of all its benefits (López de la Madrid, 2007). Undoubtedly, students in contact with ICTs obtain the benefits of access to information, more-fluent communication, and the advances in training. However, this requires educational actions related to the use, selection, and organization of information, so that the student is trained to become a mature citizen of the information society (Salinas, 2004).

2.2 Benefits of Technological Education

Education is one of the best means through which one can obtain a sense of unity between students and professors in the classroom, as well as build confidence and independence within the students (Salinas, 2004). Educational technology has also proven to play an essential role in achieving these traits and has become the source of fundamental changes in the classroom. The use of technology in education has allowed students to access information outside of classrooms, and this has caused an increase in self-motivation for learning. For example, Azma (2011) found that educational technology helps students significantly improve their scores by expanding the information they can access and, as a result, to broaden their learning environment (Personal Learning Environment). Also, the use of technology has also made education more dynamic and exciting. In particular, studies have shown that tweets are considered a more interactive form of learning compared to traditional knowledge-transfer tools such as lectures (Menkhoff, Chay, Bengtsson, Woodard & Gan, 2015). Technology has also allowed the development of collaborative learning and greater participation by students. Collaborative learning implies a greater involvement of the classroom community in the learning on a specific topic (Shi, 2016). For example, Wheeler (2010) showed that social networks help students to create a positive contextual training space concerning pedagogical objectives and to get involved in collaborative learning. Such networks motivate students to interact through posting comments or questions on blogs or by "tweeting" on relevant topics. Online education offers new possibilities for open and flexible learning (Salinas, 2004), which can promote new hybrid models of teaching practices, with teaching methods that require new types of learning experiences. According to Floridi (2014), among the tools that provide greater communication—as well as combine education with ICTs in a specialized manner—are learning analysis or artificial intelligence, adaptive learning, calibrated peer review and scoring automated tests (Balfour, 2013). These are advanced processes that, if they are functional interfaces, can allow teachers to concentrate on human attributes such as caring, creativity, and participation in problem-solving. Finally, the use of technology in education has also helped reduce administrative expenses (Ilgaz, 2015). In particular, the possibilities that the Internet offers are extensive. Thanks to the ease of sharing content, it is possible to use the network to provide students with eBooks and interactive tools to carry out their activities and exercises. Without the need for paper books, the cost of books and other learning materials, as well as administrative costs, can be reduced (Nieto & Diaz, 2005).

2.3 Challenges of this technological era

The implementation of technology in each vocational school and university must be designed and regulated according to the purposes and goals of each institution since one of the most significant challenges is the lack of clarity in planning and implementing it. Such planning should be focused on generating motivation for the use of technologies through strategies that

allow virtual classrooms to be an alternative learning space (Freitas et al., 2018). The challenges currently facing education imply the incorporation of new pedagogical technologies in a more open and flexible formal education, as several authors have recently pointed out (Castañeda & Adell, 2013). On the other hand, vocational schools today do not require instructors to be trained in technology. Because of this, teachers that are not trained in technological applications have a competitive disadvantage in the labor market versus teachers who do have experience with the use of technology. A teacher without such training is an intermediate staff member not qualified for the labor market (Dahil, Karabulut & Mutlu, 2015). That is, most teachers do not have the level of knowledge or the teaching experience necessary for an adequate education process (Mendoza, Baldiris & Fabregat, 2015). The instructors, who will be implementers of the technological integration, are severely hampered in using the technology because these instruments are sophisticated, and instructors do not have enough academic equipment (Dahil et al., 2015). In other words, future teachers must learn in an applied way about the use of technology and extend it with pedagogical practices throughout their training for their professional development.

3.0 Methodology

The questionnaire was designed and used to collect data from respondents on the utilization of e-learning technologies for improving teaching in tertiary school. The target population was 200 comprising 20 lecturers and 180 students from Tertiary institution in Sokoto State (Sokoto State University). Sample size was derived from Taro Yamane's formula for a finite population consisting of the 20 lecturers and 180 students who were randomly selected using simple random sampling technique. The lecturers and students were chosen because they and utilization of e-learning technologies. The lecturers and students use e-learning technologies for the teaching and learning process. The instrument for data collection was a40 item structured questionnaire. The questionnaire was administered and collected by the researcher with the help of two research assistants. The data obtained was analyzed using Statistical Packages for Social Sciences (SPSS). Percentage was used to answer the research question for section A while mean and standard deviation were used to answer the research questions for section B and C. The mean rating of 2.50 was used for decision regarding the research questions. This was calculated based on the 4 point rating interval used for the study. Items with mean values of 2.50 and above were considered as agreed while items with mean values below 2.50 were considered as disagreed.

4.0 Results

Table 1: Respondents on utilization of E-Learning Technologies for Improving Teaching and Learning in Tertiary institutions in Sokoto State

S/N	Items	A	N/A	Remarks
1	Internet and web	45%	55%	Available
2	browser E-journals	55%	45%	Available
3	Interactive white	52%	48%	Available
4	board Compact disk	63%	37%	Available
5	Digital library	40%	60%	Not Available
6	E-book	35%	65%	Not Available
7	Computer simulation	15%	85%	Not Available
8	Multi-media projectors	55%	45%	Available
9	Power Point	62%	38%	Available
10	Video/Teleconferencing	10%	90%	Not Available
11	Computers	65%	35%	Available
12	Smart phones	82%	18%	Available
13	Learning Management System	10%	90%	Not Available
14	E-mail	65%	35%	Available
15	Blog	55%	45%	Available

A = Available, N/A = Not Available

The result in Table 1 shows that out of 15 items, 10 items (1, 2, 3, 4, 8, 9, 11, 12, 14, and 15) had a percentage between 62%-92%, indicating that most of the respondents agree their e-learning technologies utilizing in Tertiary institutions in Sokoto State. It was also discovered that the remaining five items (5, 6, 7, 10, and 13) had a percentage between 55%-85% indicating that most of the respondents agree that those items are not utilizing in Tertiary institutions in Sokoto State.

Table 2: Respondents on the Utilization of E-Learning Technologies by Lecturers for Improving Teaching and Learning in Tertiary institutions in Sokoto State

S/N	Item Statements	$\bar{X}$	SD	Remarks
16	Lecturers use the internet to facilitate teaching and learning.	3.69	0.47	HE
17	Lecturers prefer the use of e-books/e-journals to offline/hard copy books when sourcing for academic information.	1.80	0.75	LE
18	Video/teleconference is employed by lecturers to enhance teaching and learning.	1.31	0.47	LE
19	Lecturers use multi-media projectors to present lessons.	3.19	0.69	HE
20	Lecturers use learning management system to post academic information.	1.27	0.45	LE
21	Lecturers use blogs for research.	2.77	0.82	HE
22	Lecturers employ the use of e-mail in giving and receiving students' assignment.	3.58	0.50	HE
23	Lecturers use e-journals in the publication of journal articles.	3.58	0.87	HE
24	Lecturers employ the use of digital library in retrieving information	1.58	0.50	LE
25	Lecturers use interactive white board to record video or audio lectures for students.	2.04	0.96	LE
26	Lecturers use the computer to get information online via the internet.	3.92	0.27	HE
27	Lecturers use computer simulations to aid teaching and learning.	1.27	0.45	LE
28	Lecturers use interactive white board to teach abstract contents	2.50	0.16	HE
29	Lecturers use interactive white board to coordinate class teaching			
	Grand Mean			

$\bar{X}$ = Mean, SD = Standard Deviation, HE = High Extent, LE = Low Extent.

The findings in Table 2 revealed the responses to items 16-27, the mean ratings as well as the standard deviation. The mean ratings of items 16, 19, 21, 22, 23 and 26 ranged from 2.77 and 3.92 which implied high extent of utilization because it is above 2.50. Items 17, 18, 20, 24, 25 and 27 had mean ratings ranging from 1.27 and 2.04 indicating low extent of utilization. The standard deviation of the items ranged from 0.27 and 0.96. The grand mean of 2.50 implied that the respondents generally agreed that the e-learning technologies are utilized to a high extent.

Table 3: Respondents on the Utilization of E-Learning Technologies by Students for Improving Teaching in Tertiary institutions.

S/N	Item Statements	$\overline{X}$	SD	Remarks
30	Students use digital library for academic research and further studies.	2.00	0.73	LE
31	Students use the computer to get information online via internet.	3.39	0.61	HE
32	Students prefer the use of e books to offline books when sourcing for academic information.	2.00	0.94	LE HE
33	Students use multi-media project or for seminar presentation and project defense.	3.24	0.71	HE HE
34	Students use smart phones for recording lectures in class for future references.	3.57	0.54	HE
35	Students use blogs to link to academic websites.	2.65	0.87	HE
36	Students use e-mail to submit assignments and receive information from lecturers.	3.41	0.63	LE HE
37	Students browse the internet for academic information and school registration.	3.68	0.47	HE LE
38	Students utilize video/teleconferencing for group assignments or projects.	1.35	0.58	LE
39	Students employ the use of compact disk to submit assignments in softcopy.	3.47	0.62	
40	Students utilize e-journals during research.	3.51	0.53	
41	Students use computer simulation to learn abstract ideas	1.57	0.65	
42	Students use learning management system to measure learning activities	1.42	0.50	
	Grand Mean			

$\overline{X}$ = Mean, SD = Standard Deviation, HE = High Extent, LE = Low Extent

Table 3, revealed the responses to items 28 – 40 on the extent of utilization of e-learning technologies by students in Computer Science programme in Tertiary institutions. The mean ratings of items 29, 31, 32, 33, 34, 35, 37, and 38 ranged from 2.65 - 3.68 well above 2.50 which is the real limit on the scale. This implied high extent of utilization. However, Items 28, 30, 36, 39 and 40 had mean ratings of 1.35 and 2.00 respectively. This indicated low extent of utilization. The standard deviation of the items ranged between 0.47-0.94 indicating that the respondent shave similar opinions on the utilization of the e-learning technologies. The grand mean of 2.71 implied that the respondents generally agreed that the e-learning technologies are utilized to a high extent.

4.2 Discussion of the results

The research study was focuses on the utilization of e-learning technologies for improving teaching and learning in Tertiary institutions in Sokoto State. The study found out that the internet and web browser, Interactive whiteboard, Compact disk, multi-media projector, power point, computers, smart phones, e-journals, e-mail and blog are e-learning technologies utilized while computer simulations, learning management system, e-books, video/teleconferencing,

digital library are not utilizing properly . Generally, the collected data indicates that e-learning technologies are partially utilized for improving teaching in Tertiary institutions. This finding partially conforms to the study of Gold (2001) which stated that e-learning technologies are available in all functional areas of Computer Science. Also, Pirani (2004) stated that for an institution to be able to adopt e-learning, it must provide adequate and reliable technical infrastructures. Similarly, the study identified the e-learning technologies utilized by lecturers for improving teaching and learning in Tertiary institutions. E-learning technologies such as PowerPoint, e-mail, e-journals, computers and multi-media projectors are highly utilized by lecturers in while Learning Management System, computer simulation, digital library, video/teleconferencing, e-book and interactive whiteboard for recording audio or video lectures for students are not highly utilized. However, the collected data indicates that lecturers utilize e-learning technologies. The findings of this study is in agreement with the study by Ezenwafor (2011)who found that Business Educators in tertiary institutions possess skills in information and communication technology and utilizes them in training students. This finding contradicts the view of Maduabuchi (2008) who posited that most Computer Science lecturers lack computer skills as they only base their knowledge on a computer course referred to as computer appreciation which they took in the course of their academic training.

Furthermore, another finding of the study showed poor extent of utilization of e-learning technologies by students for improving teaching and learning in tertiary institutions. E-learning technologies such as smart phones, computers, compact disk, PowerPoint and e-mail are highly utilized while e-books, video/teleconferencing, digital library are not highly utilized.

Conclusion

This study was carried out to determine the utilization of e-learning technologies for improving teaching and learning in Tertiary institution in Sokoto State. In carrying out the study, it was found that e-learning technologies such as internet and web browser, Interactive whiteboard, Compact disk, multi-media projector, power point, computers, smart phones, among others are highly utilized by both lecturers and students in the institution, while Learning Management System, digital library, computer simulations, electronic books, video/teleconference are utilized to a low extent by both lecturers and students. E-learning has come to stay under the preview of Computer Science and the only option is to fully embrace it because with the information technological breakthrough in the 21st century, e-learning technologies have become valuable tools for teaching, learning and research.

Recommendations

1. Lecturers should be encouraged to fully utilize the available e-learning resources in teaching all Computer Science courses, carrying out research and preparing students result.
2. Computer Science lecturers should prepare e-books and e-journals so as to encourage the students in the reading of e-books and e-journals.
3. The management of tertiary institutions should ensure optimal functioning of platforms like learning management systems, open course ware, Moodle etc, which will create the opportunity for efficient administration, documentation, examination, feedback giving and reporting of class room and online events.

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