

MODERN TECHNOLOGIES NEEDED FOR E-LEARNING FUNCTIONALITY FOR UNIVERSITY EDUCATION SUSTAINABILITY IN NIGERIA

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Abstract

This study investigated the modern technologies needed for e-learning functionality for university education sustainability during and after covid-19 pandemic global challenges. Two research questions were formulated to guide the study. The study adopted survey research design. The population of the study was 350 information officers from federal universities in Nigeria. A 30 item questionnaire was used to identify modern technologies needed for e-learning functionality for university education sustainability. The instrument was subjected to both face and content validation by three experts. An internal consistency co-efficient of 0.89 was established using Cronbach Alpha analysis. Data collected were analyzed for the study. Mean and standard deviation were used in data analysis. Findings revealed that thirteen items of communication technologies and all items of technologies management strategies were needed for e-learning functionality for university education sustainability. The study concluded that there is need to promote e-learning in university education in Nigeria so as to ensure that both lecturers and students adopt e-learning designs that are most appropriate for the achievement of educational goals. It recommended among others that effective implementation of e-learning in university education in Nigeria will help develop skills in the learners and increase the employability of graduates.

Keywords: Modern Technologies, E-learning, Functionality, University and Sustainability

Introduction

Information and communication technology are already a vital factor in successful development of education. University is a decisive stage, hence learning and studying at this stage has the most potential impact on forming new member of the knowledge community. Improved university is essential to the creation of effective human capital in any country. The need for information and communication technology in Nigeria universities cannot be overemphasized. In this technology driven age, everyone requires ICT competence to survive (Chukwunzie & Nwogwugwu, 2013). It should be noted that currently the world over, the relevance of educational programme is accepted to the extent it meets the needs of the individuals, society and emphasis is shifted from education for mere knowledge to education for relevance. Education for relevance simply implies education designed to meet the societal needs that is knowledge should be acquired alongside with skills and competencies (Anioke, 2013).

According to Herman & Cameron Offem and Anashie (2021), within the realm of teaching, university education includes both the undergraduate and the graduate – level or post graduate level for qualified students who wish to go further in their education and skills development. These descriptions of the university education suggest that it has a wide range of students to attend to and thus requires suitable technologies that would satisfy the needs of these various classes of students.

Anrimbad, Aremu & Adedola (2003) viewed technology as a systematic and integrated organization of man, machine, ideas and procedures to achieve a designed goal. There has been evidence of various products of technology be introduced into the teaching – learning process which has given birth to the branches of learning called E-learning.

Similarly, Schwartzberg (2006), technology is the making, usage and knowledge of tools, machines, techniques, crafts, systems or methods of organization in order to solve a problem or perform a specific function. It can also refer to the collection of such tools, machinery and procedures involved in meeting a need. Ibezim (2013) viewed technology as all the methods, tools, machinery and procedures that will enhance university education.

The shift from the traditional method of teaching activities to the electronically driven method of teaching it faced with challenges. The quick movement to the electro community trend demands a fast movement towards the technology demand. And, this will become very possible when the opposing variable that is the challenges of such shift in activity is address. The failure of universities to acquire enough teaching facilities and equipment and more complex is issue of teaching equipments all contribute great challenge.

Agomuo in Okafor (2009) opined that the worst hit of the problem is the unpreparedness of Nigeria by the time we accepted the technology. He noted that if the present day office is witnessing more marvels than that of yesterday, and since the technological off shut is still far going that the office of the future will be more sophisticated and thus place more demand on developing the

necessary workforce. The challenge facing the lecturers in using these technology demands a cost such challenges so as to have a good result. This can be achieved through the development of the necessary needed skill. According to Ahukunnah & Ugoji in Anashie et al (2018), the new technology helps some existing problems and at the same time creates new ones.

In this 21st century, one of the tools used to enhance university education is the e-learning service. E-learning according to Otuka (2010), e-learning comprise all forms of electronically supported learning and teaching which are procedural in nature and aim at construction of knowledge with reference to individual experience and practice. Information communications system, whether networked or not, serve as specific media to implement the learning process. E-learning is the delivery of a learning, training or education programme by electronic means, involves the use of computer or electronic device in some way to provide training, educational or learning materials (Obumneke Okeke & Anyacheblu in Anashie, Offem & Okeke, 2018). World Bank (2003) maintained that when the potential of e-learning is fully harnessed, it could be advance knowledge by expanding and widening access, improving the quality of education and reducing cost.

Mayadas in Oakley (2000), e-learning is a process in which learners can communicate with their instructors and their peers, and access learning materials, over internet or other computer networks. E-learning is the application of the internet to support the delivery of learning skills and knowledge using a holistic approach which may not be limited to a particular course, technology or infrastructure (Brock, 2002). It provides flexibility which allows for just-in-time training when and where they are needed. E-learning creates room for integration into work place in terms of relevance, access to experts and collaboration for team working Hedge & Haywand in Anrimbad et al (2003), further defined e-learning as an innovative approach for delivery electronically – mediated, well designed learner-centered and interactive learning environments to anyone, anyplace, and anytime by utilizing the internet and digital technologies to consonant with instructional design principles. In the same vein, Anibogu (2003) opined that e-learning brings proven benefits to students and lecturers in terms of cost effectiveness and efficiency, encouraging students to take responsibilities for their own learning which will be of benefit to them. Worldwide learn in Anashie et al (2018) noted that e-learning has many benefits which include:

- Enhance and consistent mode of delivery of knowledge
- Easy and regular administration of individual and group assessments
- Awareness of the institution
- Unhindered interaction among teachers and students
- Collaboration with other institutions like universities. This collaboration, decreases the digital dividend between institutions in developing countries and developed countries.
- E-learning, needless to say, makes learning self-paced for the students, and puts the student on the driving seating on the highway of learning. The student in other words has a better control over the learning method, learning is personalized.
- Learning when it is online or distance learning removes the geographical barriers of learning for the students and teachers.
- There might be no need for study leave for workers running a programme in school.
- E-learning makes knowledge available on demand anytime, anywhere and anyhow. Other benefits include:
 1. Fits into anybody's schedule because it can take place anytime and anywhere,
 2. Gives every individual the opportunity to learn at his or her own pace,
 3. Enriches the instructional process through the provision of online interactive learning environments
 4. Provides online learning environment that is time and cost effective;
 5. Promotes the development of self-directed ability;
 6. Facilitates and enriches the delivery of learning content;
 7. Enhances learning performance; and
 8. Promotes independency in learning.

The attributes of e-learning according to Naidu (2006) include;

- Enable flexible access to information and resources
- Enable electronic access to hypermedia and multimedia-based resources; and

- Afford a wide range of opportunities to capture, store and distribute information and resources of all forms and formats. These attributes of e-learning can be realized through individualized self-paced offline and online e-learning as well as synchronous or asynchronous group-based e-learning. Synchronous e-learning implies communication in real time such as in chats in audio and video conferencing while asynchronous e-learning refers to communication with time delay such as online discussions through electronic mailing list. Both the individual group-based e-learning can occur in any type of e-learning (Hrastinski, 2008). The common types of e-learning are e-learning, blended learning, virtual learning and distance education, among others.

The use of e-learning in the instructional process is gaining global acceptance as a veritable tool for the realization of the education for All (EFA) vision.

E-learning brings learning to people, reduces cost of learning experiences and helps develop a more flexible innovation and creative student. This implies that technology enhanced learning and online instruction is recognized as a viable tool necessary for preparing citizens to participate in the technologically driven global environment (Liverpool, Marut, Ndam & Oti, 2009). A multidisciplinary approach to online pedagogical research recognizes the value of technology – enhanced teaching and learning as critical in the mix of diverse strategies. Its centrality in the global market place has been enhanced by a new culture shared by many educators. E-learning has reported by Lamillard (2004) has been used very effectively in university teaching for enhancing the traditional forms of teaching and administration. Students on many courses in many universities in developed countries now have web access to the lecture notes and selected digital resources in support of their study, personalized web environments in which they can join discussion with their class or group, and this new kind of access gives them much greater flexibility of study. Part time students can more easily access their courses and this in turn supports the objectives of wider participation removing the traditional barriers to higher education (university) study. Many nations in Africa today, have also embraced the e-learning inventions.

In most Nigerian universities, there are intensive efforts to put e-learning in place. It has been practiced in one way or the other in the schools system. However, when there is a need for enrollment into the schools through e-learning channel, there seems to be hitches here and there, especially technologically. E-learning in Nigerian universities and educational institutions according to Ajadi, Salawu & Adeoye (2008) is still a dream because of poor ICT infrastructure and other socio-economic reasons. The challenge facing Nigerian universities now is to sustain e-learning so as to avail the various and numerous students craving to be enrolled into the universities the opportunity with come. Hence, this study seeks to identify e-learning technologies that are needed for e-learning functionality for university education sustainability during and post covid-19 pandemic global challenge. Specifically, the study attempts to investigate:

1. The communication technologies needed for e-learning functionality for university education sustainability during covid-19 pandemic global challenges.
2. The technologies management strategies needed for e-learning functionality for university education sustainability during covid-19 pandemic global challenges.

Research questions

The following research questions guideline

1. What are the communication technologies needed for e-learning functionality for university education sustainability during covid-19 pandemic global challenges?
2. What are the technologies management strategies needed for e-learning functionality for university education sustainability during covid-19 pandemic global challenges?

Methodology

The researchers adopted survey in the study. The study was conducted in Nigeria federal universities.

The population was 800 information officers from federal universities. A sample of 330 information officers obtained through stratified sampling technique. The instrument for data collection was a self-structured questionnaire called “Modern technologies for E-learning Functionality Questionnaire (MTEFQ)”. The instrument was structured on a 4-point scale with the

following responses. Highly Needed (HN), Needed (N), Slightly Needed (SN) and Not Needed (NN) which were weighted, 4,3,2 and 1 respectively. The instrument was face validated by four experts, one each from educational management, measurement and evaluation, ICT unit and information officer. The Cronbach alpha technique was used to obtained the internal consistency of the instrument which yielded a coefficient of 0.89. The mean score was used to answer the research questions while standard deviation was used to determine the closeness. Any item with less or low standard deviation indicated that there were less variations in the responses of the respondents, showing that the mean score of the items were valid.

Presentation/Results

Research question 1: What are the communication technologies needed for e-learning functionality for university education sustainability during covid-19 pandemic global challenges?

Table 1

Mean ratings on the communication technologies needed for e-learning functionality for university education sustainability

S/N	Items	X	SD	Remarks
1	Wikis	3.82	0.39	Highly needed
2	Blogs	3.65	0.49	Highly needed
3	E-mail	3.54	0.56	Highly needed
4	Discussion Boards	3.49	0.79	Needed
5	Chat rooms	3.65	0.49	Highly needed
6	Text notes	3.29	0.77	Needed
7	Virtual classrooms	3.12	1.11	Needed
8	Breakout sessions	2.06	0.56	Slightly needed
9	Microphone rights	3.47	0.51	Needed
10	Multimedia programming	2.76	0.90	Needed
11	Electronic portfolios	2.17	0.79	Slightly needed
12	Collaborative software	3.47	0.51	Needed
13	Websites	3.18	0.73	Needed
14	Active laptops	46	.71	Needed
15	Internet connectivity	3.85	0.34	Highly needed

In table 1 analysis revealed that 5 items had their mean rating value ranging from 3.54 – 3.85 indicating that the communication technologies represented by the items are highly needed for e-learning functionality for university education sustainability during covid-19 pandemic global challenges. It also showed that 8 items had their mean ratings ranging from 3.18 – 3.47 revealing that the communication technologies represented those items that are also needed for e-learning functionality for university education sustainability. While the remaining 2 items had mean rating value which ranged from 2.06 – 2.17 indicating that the communication technologies represented by the items are slightly needed. Furthermore, the analysis showed that the standard deviation of the items ranged from 0.34 – 1.11 which is a low range of values. The analysis also indicates that the respondents varied in their responses higher/more on text notes as a communication technology needed for e-learning functionality for university education sustainability than on the internet technology.

Research question 2: What are the technologies management strategies needed for e-learning functionality for university education sustainability?

Table 2
Mean ratings on the technologies management strategies needed for e-learning functionality for university education sustainability

S/N	Items	X	SD	Remarks
1	3G mobiles	3.80	0.45	Highly needed
2	Podcasts	3.59	0.37	Highly needed
3	Search engines	3.29	0.77	Needed
4	World wide web	3.50	0.66	Highly needed
5	E-college	2.88	0.69	Needed
6	Moodle	3.85	0.44	Highly needed
7	Word processed documents	3.47	0.51	Needed
8	PDF files	2.94	1.03	Needed
9	Streaming video and audio	3.18	0.39	Needed
10	University animation, stimulation and sports	3.47	0.51	Needed
11	ICT aided testing and assessment	3.00	0.61	Needed
12	Learning basic management systems	3.35	0.41	Needed

Table 2 data analysis shows that 4 items had rating mean score ranging from 3.50 – 3.85 revealing that the technologies management strategies represented by the items are highly need for e-learning functionality for university education sustainability. The data analysis further indicated that the remaining 8 items had their mean ratings score ranging from 2.88 – 3.47 showing that the technology management strategies represented by those items that are also needed for e-learning functionality for university education sustainability. Also the analysis showed that the standard deviation of the items ranged from 0.37 – 1.11 which is lesser in range values. The analysis indicates that the respondents varied in their responses more on PDF as technologies management strategies needed for e-learning functionality for university education sustainability than 3G mobiles as shown on the table.

Discussion of findings

Table 1 identified five communication technologies items that are highly needed for e-learning functionality for university education sustainability. Eight other communication technologies needed were equally identified. These findings are accord with Shim, Shropshire, Park & Harris (2007) who stated that corporate and e-learning training and education technology such as Blogs, Wiki, Chats, e-mail and websites, to infuse e-learning into teaching and instructional models. In supporting, O'Hear in Ibezim (2013) stated that blogging is increasingly finding a home in education (both in schools and universities), as not only does the software remove the barriers to writing and publishing, it encourages students to keep a record of their thinking over time.

Blogs facilitate critical feedback, by letting readers add comments which could be from teachers, peers or a wider audience. Iioanusi & Osuagwu (2010) stated that ICT applied to education enhances the delivery and access to knowledge and reaching goals in less time. It produces richer learning outcomes compared to education without ICT. It also encourages critical thinking and offers unlimited means of achieving educational goals. Also Wikipedia (2012) records that communication technologies are generally categorized as asynchronous or synchronous activities use technologies such as blogs, Wikis, and discussion boards. The idea is that participants may engage in the exchange of ideas without the dependency of other participants' involvement at the same time.

The analysis of data on research question 2 showed that four items on technologies management strategies are highly needed for e-learning functionality for university education sustainability. Eight other strategies for technologies management needed for e-learning functionality were also identified. This findings agrees with Chinedu (2013) who stated that ICT is at the epicenter of educational development of any modern society and Nigeria cannot afford not to integrate it into her own educational system, therefore need proper management strategies. Furthermore, Alike & Ofojebe (2012) said that the school administrator is a pivotal force behind successful and effective integration of ICT in school management and administration which application of effective and

efficient technologies management strategies will enhance his productivity through podcasts, 3G mobile etc. Rosen (2006) who stated that podcasting is a new technology that provides better services. The benefit of podcasts is in its delivery mechanism and the ease of putting an audio on a website and letting ipod users download it, then listen to the content through tapes.

Conclusion

There is need to promote e-learning in university education in Nigeria so as to ensure that both lecturers and students adopt e-learning designs that are most appropriate for the achievement of educational goals. Creating enabling environment for e-learning technologies utilization appears to be the starting point. This involves making internet and multimedia facilities available for education beyond classroom borders and making concerted effort to promote digital literacy as well as the use of e-learning designs among lecturers.

Recommendations

Based on the findings; the following recommendation were made;

1. Effective implementation of e-learning in university education in Nigeria still help develop skills in the learners and increase the employability of graduates.
2. There is need for attitudinal change among people especially educationists for them to dispose themselves to the use of e-learning and other innovative techniques in promoting lifelong learning.
3. Government should set target for university graduates to be digitally literate and be capable of utilizing e-learning as a lifelong learning strategies.

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