E-Learning Instructional Facilities and Science Teacher Education in Nigeria

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Abstract

One of the most emerging trends with its challenges to quality control and assurance in teacher education is e learning. E-learning is a practical example of the challenges in the use of ICT- supported teaching and learning methods whose importance is gaining momentum with the passage of time. E-learning has become one of the most vital and potentially significant as well as efficient instructional methods to enhance quality in teaching and learning. It appears that this new trend in methods of enhancing learning is not adequately been adhered to in African higher education institutions. The paper examined academic staff effective utilization of e-learning and quality assurance in higher education with special reference to science teacher education in Nigeria. This paper was directed towards assessing the instructional facilities that are in use in some selected Colleges of Education (COEs) in Southern Nigeria. The study which was guided by two research questions was carried out through the use of questionnaire. The population of the study was 889 science student educators from the Department of Integrated Science in 13 Colleges of Education. 160 science student teachers constituted the sample of the study. Simple random sampling technique was used in selecting the sample. The data collected were collated and analyzed in frequency and mean scores. The result obtained showed that Science Schools and Departments in COEs use instructional facilities. The study also revealed that television, video, radio, primers, booklets are in use in these schools and departments. Based on the findings, it was recommended that modern instructional facilities such as computers, internet connection, CD-ROM, should be provided in these schools

INTRODUCTION: Advances in the information and communication technology have brought about tremendous challenges, changes and new trends in higher

education across the globe. One of the most exigent innovations with its challenges to quality control and assurance in education is e learning. E-learning is a practical example of the challenges in the use of ICT- supported teaching and learning methods whose importance is gaining momentum with the passage of time. The importance of electronically delivered learning as efficient instructional methods to assure quality in science education cannot be over- emphasized (Opara *et al*, 2011).

It is a worldwide-accepted fact that the use of ICT in education can bring about positive changes to the society, which requires infrastructure facilities such as electricity, telephone, educational software, Internet facilities and hardware such as computers, scanners, and multimedia projectors (Amar**a,** 2006).Colleges of Education are dedicated tertiary institutions for teacher education program in Nigeria. They perform the role of intermediary training between the Secondary school and University Education. Some of the goals of the Colleges of Education as highlighted in the National Policy of Education (FRN, 2001) are to produce highly motivated, conscientious and efficient classroom teachers; produce teachers with intellectual and professional background; and enhance teachers' commitment to the teaching profession. To achieve these stated Education goals and objectives of science education in the minimum standard for colleges of education, there is need for the integration of ICT tools in the teaching and learning of science

CONCEPT OF E-LEARNING: Abirina (2010) defines e-learning as the use of new multimedia technologies and the internet to enhance the quality of learning by facilitating access to resources and services as well as remote exchange and collaboration. E-learning is therefore a process of teaching and learning comprising instructions delivered through all electronic media such as the internet, intranets, extranets, satelites broadcasts, audio video tapes, interactive TV and CD-Rom. Body (2005) discovers that e- learning facilitates access to knowledge that is relevant and useful. It is a learning facilitated and supported through the use of ICT and learning activities based on electronic formats.

➢ It is a new trend in enhancing quality in teaching and learning.
➢ It enhances delivery of education and training of anyone; anything and anywhere.

➢ It is a quality technology that takes the classroom to geographically distinct and separate environments.

➢ E-learning whether networked or not tends to serve as the specific media to implement the learning process.

➢ It has the greatest advantages of including flexibility and convenience for the learners.

➢ It transcends the boundaries of traditional classroom instruction.

➢ Apart from creating virtual schools of classrooms, it tends to promotes equity by providing students with access to qualitative educational resources.

➢ E- learning does not only provide flexible learning options capable of addressing formal education need but also takes care of the expanding needs for non- formal education in such areas as literacy, numeracy labour- market training and retraining, lifelong learning and special human challenges such as refugee education, HIV/AIDS, epidemic, orphans and street children (Asogwa, 2006).

E-learning as an education electronic delivery methods, requires the following ICT Tools such as Compact Disc Roms (CD Roms) Video conferencing, Websites, E- mail. it covers a wide set of applications and processes such as web-based learning, computer- based learning, virtual classrooms, digital classrooms, delivery content via internets, intranet, extranets (LAN/WAN), Audio and Videotapes, satelite, interactive TVs and CD-Rom (Allen & Seaman 2008) Olorundare (2006) Observes that e- learning has an advantage of providing accelerated and required courses which eventually lead to increased graduation rates and highly reduced drop-out rate of students.(see also Opara,2009a and Opara,2009b).

E- learning has the potential of benefiting any student irrespective of the background as a result of enhancing learning opportunities provided by ICT. It allows learners to learn anything and from every location across the world. This is only possible with ICT tools. These include:

Computer: This is an electronic machine that is capable of receiving, storing, manipulating and retrieving data speedily and efficiently. This device is accepted as the best educational technology medium for individualizing instruction, its effective application comes inform of computer- based education, (CBE). BE is made up of a Computer Supported Learning Aids (CSLA) that acts as a library

where learners can have access to stored information, It is expected that University and higher education academic staff usually should utilize the new approach and facility as often as possible in a single class or network teaching.

Teleconferencing: This is the process of using telephone to enable one-to-one contact between the students and instructors, it is more beneficial when the communicators and communicants are widely dispersed and separated by difficult terrains, It also supplements face-to-face technique where efficient communication already exist. It is very efficient in task achievement but more task-centered and impersonal than face-to-face technique. Academic staff are supposed to be very efficient and effective in utilizing this e- learning method to a wide range of student etc. This will go a long way to reduce dangers of always being on the road for lectures on both lecturers and students. Cost of transportation is also reduced (Abirini, 2010). Asogwa, (2006) reports that incorporating an audio bridge, learners in remote places can call for synchronous conversation. High population of students could be attended to with less stress and pressure on both the lecturers and the students.

Interactive Video: This is very effective tool for conveying information. It involves the use of a video delivery system, usually video discussion or sometimes video tapes, deigned in a way a to respond to choices made by the individual users, The video must present the user with choices of what to see next, for this approach to become truly interactive. This simply implies that it must influence the user's action. A good example is the use of video cassette recorder (VCR)which enables one to watch movie, rewind to watch a segment over again, fast- forward to skip over parts, pause the movie or even watch it in slow motion (Ambient, 2009).

These are:

(i) Local Area Network (LAN) which exists and operates within a particular classroom or building.

(ii) Wide Area Network (WAN) which makes use of networking electronic devices that cover the entire or sections. of an institution, educational zone 'etc. It can be used to connect two campuses of same institution in different geographical zones/locations.

(iii) World Wide Web (www) Internet: These provide hypermedia access to instruction through point and click. It is network of other network

comprising several millions of computers all over the world sharing from the same data pool. It provide internet users with uniform and convenient means of accessing the wide variety of resources (e.g photos, graphics, texts, audio-video etc.) in an interactive environment. Academic staff making use of these has the advantage of enjoying within the internet service, an unusually large amount and types of resources available to them. The instructional possibilities are as follows:-

E-mail used for correspondence and dissemination of information. Newgroups accommodating discussion group in the internet.

Chart room/ messaging allows communication between groups or individuals on computers and other internet service providers.

Developing classroom home page that could cover information about the class, (syllabus, exercise, literature, conferences, biographies etc).

Streaming audio/video, web site boarding, file transfer, telenet etc. Academic staff effective use of these e-learning methods of internet tools will definitely help to bring the needed materials when the user makes use of search engines, meta- search engines, subject directory, the visible web page, electronic referral, virtual library, fascimile etcetra (Allen & Seaman, 2008).

According to Imhabekhai (1998), instructional facilities used in Nigeria are those materials which include persons, chalkboard, charts, pictures, laboratory equipments, tools, chemicals, film projectors and soon which are used by instructors and facilitators to facilitate the effective transmission of knowledge, skills and attitude to the learners.

The instructional facilities are no doubt of utmost importance to the learners because they would find their learning easy and convenient as well(Opara,2003). Instructional facilities enables the science teachers to break down his/her teaching to the level that the learners would understand which is actually what the science students require because science learners are faced with a lot of challenges which may distract them from concentration unless some enabling facilities are utilized in teaching them (Opara,2011; Opara,2012).

Statement of the Problem

To assess means to evaluate. An assessment of instructional facilities in School of Sciences at selected Nigerian Colleges of Education is to evaluate objectively the instructional facilities in the institutions. Obviously the science student teacher in

these schools want to have the skills of reading and writing which are required for teachers to function effectively for the teaching of science subjects particularly in the junior secondary schools in an ever changing world. To this end, the study sought to find out learners' assessment of instructional facilities in Colleges of Education in Nigeria.

Purpose of the Study

The main purpose of this study was to assess the instructional facilities in selected Colleges of Education. Specifically, the study aimed at finding out:

1. The instructional facilities that are in use in Colleges of Education in Some selected Colleges of Education in Nigeria.
2. the uses of of instructional facilities in the School of Sciences at the Colleges of Education

Research Questions

The following research questions guided the study:

1. What are the instructional facilities that are in use in Schools of Science Education and Departments in Nigerian College of Education?
2. What are instructional facilities in Science Schools and Departments used for?

Method

The study used the descriptive survey design. The population of the study was 889 made up of all the Schools of Science Education is 13 selected Colleges of Education in Southern Nigeria. The simple random sampling technique was used in selecting 160 respondents from the centres. The population with the sample is represented in the table below:

The instrument for data collection was questionnaire. The questionnaire was divided into two sections. Section A and B. Section A elicited information about the personal information about the personal data of the respondents while section B was on an item which relates to the research questions. The responses of the respondents were elicited using a four point Likert scale of Strongly Agree (SA), Agree(A), Disagree(D) and Strongly Disagree(SD). The researchers went personally to the School of Sciences in the Colleges of Education to collect data. The instrument was validated by three experts in Education. The three experts were requested to validate the instrument in terms of:

1. clarity of instruction to the respondents.

2. proper wordings of the items and appropriateness and adequacy of the items in addressing the purpose of the study. Their recommendations served as guide to modification of items in the instrument.

The reliability of the instrument was determined utilizing Crombach Alpha method. The co-efficient alphas for the two sections were 0.96 and 0.96. These values indicate that the instrument was highly reliable. The researchers distributed 160 questionnaire to the respondents. The researchers were able to collect 151 questionnaires because 9 questionnaires were wrongly filled. The method adopted for analyzing data include frequency counts and mean scores in respect of the research questions. The mean scores as rated by the respondents were ranked to enable assessment of relative priorities among the items. Decision was taken adopting the principles of real upper and real limits of the scale value 1 to 4 on the four point Likert scale. Any mean score above 3.0 was regarded as agreed while any mean score below 3.0 was regarded as disagree.

Results

The findings of the study are presented in accordance with the research questions that guided the study.

Research Question 1

What are the instructional facilities that are in use in School of Sciences in Nigerian Colleges of Education?

Answer to this research question is presented in Table 2.

Table 2 shows the collective opinions of all the respondents used for the study. Items 1, 2, 4, 5 and 6 agreed to the relevant items on the table. This is because the various mean scores exceed the decision rule of 3.0. except item 3 which is 2.7. It also implies that there are actually the availability of instructional facilities in School of Sciences in Nigerian Colleges of Education.

Research Question 2

What are the instructional facilities in School of Sciences used for?

Table 3 shows that all the respondents agreed to the items 7, 8, 9, 10. This implies that all the instructional facilities are meant for what have been indicated.

Summary of major Findings

The summary of the findings are stated below:

1. School of Sciences in Nigerian Colleges of Education use instructional facilities.

2. Instructional facilities used include radio, television, video, cassette recorder, primers, journals and booklets.

Discussion: The respondents agreed that School of Sciences in Nigerian Colleges of Education use instructional facilities.

Complaints from various levels of education stakeholders indicate falling standard in Nigeria education. Education researchers have shown the importance and relevance of e-learning as an innovation in facilitating knowledge. The findings of the study identified ways learning could be used to a high extent to enhance quality science teacher education in Nigeria. Such ways include facilitation of both students and lecturers access to resources, ensuring new trend quality higher education, ensuring effective utilization of e- learning technologies. This finding is in tune with the observations of Abirini (2010) that see e-learning as a measure of utilizing multimedia technologies, computer and Internet to promote quality of learning by facilitating access to resources and services.' E-learning as a new teaching and learning method, promotes quality of students learning, performance and products. This confirms Olorundare (2006) identification technologies or ICT tools which include computers, teleconferencing, CD Roms. These technologies provided opportunities for supplementing face.-to- face technique. The finding that majority of the academic staff inability to possess needed skills for effective utilization. This is in line with the observation of Asogwa (2008) that majority of academic staff lack basic ICT tools utilization skills. Some of the impediments identified include inadequate supply of electricity, low teledensity. This finding agrees with Allen (2008) who reports that impediments if not properly managed, will undermine the existing quality.

This finding agrees with the Abirini (2010) and Allen (2008) reports on impediments to effective e- learning and implementation in higher education. They identified irregular and inadequate electricity supply, low teledensity, low skills in designing course- wares, poor funding, and inadequate ICT tools utilization skills by the staff etc. These observations also are in conformity with that of the study. The study reveals ways these impediments could be redressed for enhancement of quality education. This finding is consistent with the views of Akude (2004) who stated that instructional facilities is a strategy developed to solve problem of learning in education. The findings of the study revealed that

radio, television, video, cassette recorder, primers, journals, booklets etc are the instructional facilities used in Colleges of Education. This finding corroborates with Nzeneri (2006) who stated that all these instructional facilities are available to stimulate and motivate learners. Item 3 on table 3 however indicated that computers, CD-ROM, and modern technology are not adequate in these Colleges for training science teachers.

This view requires that modern technologies like computers, internet, CD-ROM need to be install in all Schools of Sciences at COEs for promoting academic excellence and quality assurance in science and technology education. This is because technology is moving fast and in order not to be left behind in the global world, the schools of Sciences at Colleges of Education needed to be equipped with modern instructional facilities. Omolewa (1981) supported this view by highlighting that educational institutions or learning centers should be fully equipped with toilets, reading rooms, coffee and tea rooms, games rooms, snack bars, counseling rooms, music rooms, well stocked libraries and a few luxuries to serve as attractions to the science student teachers. The findings of the study also showed that instructional facilities in Colleges are used for instruction. This finding is supported by Obidiegwu (2008) who stated that video and television appeal to both sense of sight and hearing. She further stated that television broadcasting and video provide formal, non-formal and informal education. Haizel (1979) as quoted in (Nzeneri 1996) maintained that science educators have to go beyond the five senses to include "stimulus modis" which is a stimulus presented to the learners which include human interactions, direct observation of things, pictorial representation and models.

The findings indicated a very low level of ICT tools utilization in science education by lecturers in colleges of education. Also, school type was found not to have influence on the level of ICT Tools utilization by lecturer in colleges of education. This finding agreed with that of Ugbede (2014) that college type does not have any influence on the level of instructional media utilization. The reasons given by the lecturers for low utilization of ICT tools are; that most of the ICT tools are not available for use, and where available are grossly inadequate, unstable power supplies among others. Consequently, could be the reason for the very low level of utilization of ICT tools as indicated in Table 1. These reasons agreed with the problems identified by Nsofor, Nasiru and Abdu (2012) as factors

hindering the effective instructional delivery of ICT in Nigeria colleges of education.It was also observed that the Government policy on innovative strategies such as ICT cannot become actualized unless and until the existing computation facilities (online connection, internet services, computers, computer laboratories) in our schools, colleges and Universities are massively upgraded for sustainable educational development

Recommendations

Based on the findings of this study, the following are recommended:

1. the government through relevant agencies should coordinate or supervise and monitor the activities of Colleges of Education. This is in order to avoid a situation of non-usage of instructional facilities.

2. Science educators otherwise known as lecturers should have the knowledge and usage of the instructional facilities.

3. Modern instructional facilities like internet, computer, laboratories should be provided in the Schools of Science Education at Nigerian Colleges of Education(COEs).

4. Both lecturers and students should have access to these facilities where available.

5. Adequate training should be organized for both teachers and students on the use of ICT facilities.

6. Adequate funding of ICT by the government, NGOs, Government and other stakeholders.

7. There should be stable and regular power supply.

8. Increase of internet bandwidth for easy accessibility to the internet.

9. Provision of instructional software packages for instruction.

Conclusion

Science educators ought to take the use of instructional facilities in learning seriously. This is important because learners would be motivated and encouraged when they are taught with instructional facilities. It can be concluded that provision of relevant and modern instructional facilities will go a long way in facilitating teaching and learning in promoting science, technology and mathematics education in Nigeria. In conclusion, the potentials of ICT tools in instructional delivery in science education have been established in literature. Therefore, if the desire to be among the global community, through an

educational system driven by effective integration of ICT, can only be actualized in our schools, colleges and Universities if the ICT facilities are available and are upgraded.

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Table 1: Population and Sample of Respondents

S/N	Centre	Population	Sample
1.	A	205	37
2.	B	80	20
3.	C	75	11
4.	D	90	20
5.	E	52	14
6.	F	50	6
7.	G	41	9
8.	H	37	7
9.	I	28	3
10.	J	60	12
11.	K	58	5
12.	L	50	3
13.	M	63	13
	Total	889	160

Source: School of Sciences at Colleges of Education(COEs), 2013

Table 2: Mean Responses of the respondents on the instructional facilities that are in use in School of Sciences at Colleges of Education.

S/NO	ITEMS	SA	A	D	SD	TOTAL	MEAN	DECISION
1.	School of Sciences at COEs generally use instructional facilities	56	86	6	3	151	3.3	Agree
2.	School of Sciences at COEs equally use instructional facilities	75	52	19	5	151	3.3	Agree
3.	Computers, CD-ROM are in use in School of Sciences at COEs	22	73	46	10	151	2.7	Disagree
4.	Video, television, radio, cassette recorder, public address system, film projection are in use in School of Sciences at COEs	69	58	16	8	151	3.2	Agree
5.	Journals, primers, newspaper, booklets	71	44	25	11	151	3.1	Agree

	are in use in School of Sciences at COEs						
6.	Cardboards, woods, clay, are in use in School of Sciences at COEs	68	57	18	8	151	3.2	Agree

Table 3: Mean responses of the respondents on the uses of instructional facilities in School of Sciences at Colleges of Education (COEs)

S/NO	ITEMS	SA	A	D	SD	TOTAL	MEAN	DECISION
7	The instructional facilities in School of Sciences at COEs are meant for instructions	87	58	3	3	151	3.5	Agree
8.	Video, television, film projection, radio are used for recording, transmitting the learners voice and for presenting facts, pictures	43	76	25	7	151	3.0	Agree
9.	Journals, primers, newspapers, booklets are used for improving learners reading skills	42	84	15	10	151	3.0	Agree
10.	Cardboards, woods, clay are used to display or draw pictures that stimulate reading	90	55	4	2	151	3.5	Agree