AVAILABILITY OF E-LEARNING DEVICES AND STRATEGIES FOR IMPROVEMENT IN SECONDARY SCHOOLS IN ANAMBRA STATE

By

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ABSTRACT

This study investigated availability of e- learning devices and strategies for improvement in secondary schools in Anambra State. Three research questions and one null hypothesis tested at 0.05 level of significance were used for the study. The design of the study was a descriptive survey research design. The population of this study comprised all the 98 technology teachers in Awka education zone of Anambra State out of which a sample of 31 teachers was purposively drawn. A 26-item questionnaire structured and validated was used to generate data for the study. Data obtained were analyzed using percentage, mean and standard deviation to answer the research questions while t-test statistic was used to test the hypothesis. The findings revealed that most schools have computer laboratories, laptops, some computers and standby generators but lack some e-learning devices such as slides, projectors, among others. The study also revealed that technology teachers encounter a lot of problems in the use of available e-learning devices such as poor power supply and illiteracy. However, some strategies were suggested by the researcher for improvement of e-learning devices by technology teachers such as provision of adequate ICT infrastructure. Some recommendations were made such as organizing seminars and workshops for technology teachers and improving power supply.

Keywords: E-learning, e-learning devices, teaching and learning, technology subjects and technology teachers.

INTRODUCTION

Information and communication technology (ICT) has been generally adopted by all levels of education in the country as an innovative system in teaching and learning. The

new technology has reduced the world to a global village with significant impact in the field of education leading to electronic teaching and learning known as e-learning. According to Moe and Blodget (2000), the e-learning has opened up opportunities for individuals to access information and learning programmes through the internet. This implies that e-learning is revolutionalizing education by removing distance and making knowledge more accessible to all.

All branches of education have accepted this emergent technology as a veritable tool for education services delivery. Due to its importance, technology subjects have to align with this emergent ICT. This is necessary because according to UNESCO (2011), ICT provides teachers and students access to vast stores of knowledge beyond the school, as well as multi-media tool to add to this store of knowledge. The huge growth of computers, the internet and other electronic devices provide opportunities for the development of quality teaching and learning of technology subjects. Technology subjects taught in the secondary schools include basic technology, technical drawing, building construction, woodwork, applied electricity/electronics, auto-mechanics, general metalwork, home economics, food and nutrition, physics among others (FRN, 2008). The teaching of these technology subjects are confined to the classrooms with few ill-equipped workshops and laboratories using the teacher centered method. Teachers are the key factors in any educational innovation. They need training in the use of the new technology (e-learning devices) to enhance teaching and learning of technology subjects.

E-learning simply means electronic learning. Adeosun (2010) refers to e-learning as comprising the combination, implementation and relationship of teaching and learning via different ICT media such as computer, internet, multimedia, projector, video tapes, CD-ROM, flash drives, satellite, telephone, television among others. According to

Marriot (2009) e-learning enables teachers to combine traditional methods of teaching with the internet facilities. Matogo (2009) agreed that e-learning compliments the work of teachers because extra materials and questions could be provided on-line for students.

As the world is increasingly getting technologically driven, globalized, competitive and competent-based, the role of teachers for effective e-learning programmes becomes critical. Just as the students need media competence to manage knowledge independently, teachers on the other hand have to be willing to structure content differently and put the students at the center of activities (Osuala, 2009).By so doing, e-learning centres on the students. In this case, the teacher acts as a resource person or facilitator meeting students at continued contact and increased guidance and feedback. Hedge and Hayward (2004) opined that e-learning offers well designed, learner centered and interactive learning environment to anyone, anyplace and anytime by utilizing the internet and digital technologies in connection with instructional design principle.

There is no gain saying the fact that teachers are the key factors in e-learning programs which requires competence in managing the required e-learning devices. However, Evoh (2007); Jegede and Owolabi (2008) lamented the infrastructural deficiencies and shortage of e-learning facilities such as online classroom, software, telecommunication facilities and inadequate power supply for teaching and learning in secondary schools. However, Yau (2005) advised that certain infrastructures like computers, internet facilities, sustainable power supply, human capacity development and political-will by the government should be put in place to make e-learning a reality in schools.

To design and develop on-line courses, teachers require a thorough knowledge of the main components of on-line teaching and learning. Khan (2001) identified such components as content development, multimedia, internet tools, computers, storage devices, service providers and browsers. Uzodimma (2006) however, pointed out that the problem is that teachers lack necessary competencies for utilizing the computer and operating other educational software and connecting to the internet to source information on education. Based on these problems, teachers of technology need training in ICT administration and management of e-learning applications, Anderson (2005) agreed that all the teachers should be trained to be familiar with e-learning experiences as ongoing professional development.

STATEMENT OF THE PROBLEM

E-learning devices make teaching and learning less burdensome, effective and result-oriented by providing avenue for sharing ideas and information (Adeosun, 2010). E-learning comprises of all forms of electronically supported teaching and learning, which are procedural in nature and aim at construction of knowledge with reference to an individual experience and practice. According to Stockley (2003), e- learning is the delivery of a learning, training or education programme by electronic means which involves the use of a computer or electronic device in some way to provide training, educational or learning material.

The teaching and learning of technology subjects in secondary schools require instructional materials such as ICT facilities. ICT facilities are set of tools that help one work with information and perform tasks related to information processing. There are various forms of ICT facilities in the society ranging from computer, laptops, internet, digital calculators, among others (Adeosun, 2010). According to Uzodinma (2006), some technology teachers in the secondary schools cannot effectively use ICT facilities in

teaching due to lack of competence in basic ICT. However, Uzodinma noted that the emergence of e-learning applications in educational delivery services in the secondary schools pose a lot of problems to the teachers. Notably, some of the technology teachers in secondary schools lack the adequate knowledge and skills required for effective e-learning instructional delivery. There are also problems associated with erratic power supply, poor funding, inadequate bandwidth, insufficient computers, low literacy, weak and inadequate infrastructures, shortages and inadequate teaching materials among others. The existences of these problems challenge the full utilization of e-learning applications in teaching and learning of technology subjects.

In the nation's quest for technological development, technology education has an important role to play. One innovation that may boost the teaching and learning of technology subjects is the use of modern technologies which help bring knowledge to the door steps of every Nigerian. The degree of efficiency of technology teachers in carrying out their function is to a great extent dependent on the availability and usage of the necessary ICT facilities in the classrooms. It therefore becomes necessary to investigate the availability of e-learning devices and strategies for their improvement in secondary schools in Anambra state.

PURPOSE OF THE STUDY

The purpose of this study was to investigate the availability of e-learning devices and strategies for improvement in public secondary schools in Anambra state. Specifically, the study intends to find out

(1) The e-learning devices available in teaching technology subjects in secondary schools.

(2) The problems encountered by technology teachers in the use of e-learning devices.

(3) Strategies for improving the use of e-learning devices in teaching technology subjects in secondary schools.

RESEARCH QUESTIONS

The following research questions guided the study:

1. What are the e-learning devices available for teaching technology subjects in secondary schools in Anambra State?
2. What are the problems encountered by technology teachers in the use of e-learning devices?
3. What strategies could be used to improve the use of e-learning devices by technology teachers in secondary schools in Anambra State?

HYPOTHESIS

The following null hypothesis was tested at 0.05 level of significance.

Ho_1: There is no significance difference between the mean rating of male and female technology teachers on the problems encountered in the use of e-learning devices.

METHODOLOGY

The study adopted a descriptive survey research design aimed at investigating the availability of e-learning devices and strategies for improvement in public secondary schools in Anambra State. The technology subjects used in this study included basic technology, technical drawing, building construction, and general metalwork. The population of the study consisted of all the 98 technology teachers teaching in public secondary schools in Awka Education Zone of Anambra State. Awka Education Zone consists of five local government areas namely Awka North and South, Njikoka, Anaocha and Dunukofia. A purposive sampling technique was used to select three local government areas namely Awka south, Njikoka and Anaocha out of which three public

schools were purposively selected based on the availability of technology teachers and connection to electricity. All the 31 teachers teaching basic technology, technical drawing, building construction and general metalwork in the nine schools formed the sample of the study. A 26- item structured questionnaire developed by the researcher and based on the three research questions titled “Improvement of E-learning Devices Questionnaire” (IEDQ) was used for data collection. The first section of the questionnaire contained nine e-learning devices to which the respondents were to rate whether they were available or not. The second and third parts of the questionnaire on the problems encountered and strategies for improving the use of e-learning devices respectively had four point response scale option of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) which the respondents responded to. The instrument was face and content validated by three experts from Nnamdi Azikiwe University, Awka namely: two from Vocational Education and one from Computer Science departments respectively. The researcher administered 10 copies of the questionnaire to 10 technology educators teaching in 10 public secondary schools in Aguata local government Area of Anambra State who were not part of the study. The data collected were analyzed using Cronbach Alpha and a reliability coefficient of 0.79 was obtained which was considered adequate. The researcher distributed 31 copies of the questionnaire directly to the respondents and had a 100% return. Percentages, mean ratings and standard deviation were used to analyze data from the research questions while the t-test statistic was used to indicate the existence of significant difference at 0.05 level of significance.

A mean of 2.50 and above indicated that the respondents agreed with an item while a mean of 2.49 and below indicated that respondents disagreed with the item.

RESULTS

The findings of the study based on analysis of data to the research questions and hypothesis are presented in the tables below

RESEARCH QUESTION 1: What are the e-learning devices available for teaching technology subjects in secondary schools in Anambra State?

Table 1: Mean Responses of Technology Teachers on the E-learning Devices Available for Teaching and Learning Technology Subjects.

S/N	Items	Available	Not Available	% of Availability
1.	Computers	29	2	93.5
2.	Laptops	25	6	80.6
3.	Standby generators	24	7	74.4
4.	Internet facility	14	17	45.2
5.	CD-Roms and flash Drives	12	19	38.7
6.	Computer laboratories	30	1	96.8
7.	Projectors	12	19	38.7
8.	Slides	10	21	32.3
9	Audio- Visual devices	9	22	29.0

Table 1 showed the percentage availability of e-learning devices. This shows that some e-learning devices such as computers, laptops, standby generator, and computer laboratories with percentage values of more than 50 each were available in the secondary schools. However items 4, 5, 7, 8 and 9 with percentage values of less than 50 were indicated as e-learning devices that were not available. This showed that e-learning devices were lacking in the public secondary schools in Anambra State.

RESEARCH QUESTION 2: What are the problems encountered by technology teachers in the use of e-learning devices?

Table 2: **Mean Responses of Technology Teachers on Problems encountered on the use of e- learning Devices in Teaching and Learning Technology Subjects.**

S/N	Items	$\bar{X}$	SD	Decision
1.	Lack of fund	3.64	0.82	Agree
2.	Irregular power supply	4.52	0.99	Agree
3.	Low computer literacy level of technology teachers	3.75	0.91	Agree
4	Lack of support from the government	3.07	0.73	Agree
5.	Lack of ready access to internet(insufficient bandwidth)	3.02	0.91	Agree
6.	Inadequate ICT infrastructure(computer software and accessories)	2.63	0.87	Agree
7.	Lack of time in use of ICT devices due to teaching load	3.18	0.92	Agree
	Grand Mean	**3.40**		

All the items in Table 2 had mean values above cut-off point of 2.50 showing that the respondents agreed to all the items. This implies that technology teachers encounter a lot of problems in the use of e-learning devices. The grand mean of 3.40 showed that technology teachers are faced with a lot of challenges which hinder their effective use of the available devices.

RESEARCH QUESTION 3: What strategies could be used to improve the use of e-learning devices by technology teachers in secondary schools in Anambra State?

Table 3: Mean Responses of Technology Teachers on Strategies to be adopted to improve the use of e-learning Devices.

S/N	Items	X	SD	Decision
1.	Organizing seminars and workshops for teachers	3.56	0.67	Agree
2.	Bandwidth to be increased	3.12	0.97	Agree
3.	Erratic power supply should be addressed	4.00	0.88	Agree
4.	Adequate e-learning infrastructural facilities should be provided	3.61	0.86	Agree
5.	Public private partnership should be used in funding e- learning	3.75	0.91	Agree
6.	Employment of enough ICT teachers in the secondary schools	3.41	0.73	Agree
7.	Teachers to develop themselves in ICT	1.34	0.30	Disagree
8.	Monitoring team on the available e-learning devices should be set up	3.07	0.82	Agree
9.	Distributing laptops to teachers	3.39	0.62	Agree
10.	Computation of students' results using computer software	3.62	0.90	Agree
	Grand mean	**3.30**		

From the analysis in Table 3, all the items except item 7 had mean values of more than 2.50. This indicated that technology teachers strongly agreed on the identified strategies for improving the use of e-learning devices in secondary schools. The grand mean of 3.30 indicated that the respondents agreed to these strategies.

Ho: There is no significance difference between the mean rating of male and female technology teachers in the use of e-learning devices.

Summary of T-test statistic on the Problems encountered by Male and Female Technology Teachers on the use of e-learning Devices in Teaching.

Respondents	**N**	**X**	**SD**	**DF**	**t-cal**	**t-crit**	**Decision**
Male Technology Teachers	9	3.86	1.24	29	1.35	2.05	Not
Female Technology Teachers	22	3.55	1.14				significant

From Table 4 above, it can be observed that the calculated t is 1.35 at 0.05 level of significance, which is less than the critical value of 2.05. Therefore the null hypothesis was accepted indicating that there is no significant difference in the mean ratings of male and female technology teachers on the problems encountered in use of e-learning devices in teaching.

DISCUSSION

The result obtained from Table 1 showed that secondary schools in Anambra State have some e-learning devices and infrastructure such as computers, laptops, computer laboratories and standby generators while some other devices like CD-ROMs/ flash drives, projectors, slides and audio-visual devices were not available for teachers to work with. The findings are in line with the works of Evoh, (2007); Jegede and Owolabi (2008) who lamented that e-learning facilities such as on-line classrooms, slides and projectors for teachers were not available for teaching.

Table 2 sought to find out the problems encountered by technology teachers in the use of e-learning devices. Such problems as lack of fund, irregular power supply, low computer literacy, lack of support from the government, insufficient bandwidth, inadequate ICT infrastructure and lack of time in the use of ICT devices affect the use of available e-learning devices. This finding agreed with the view of Uzodimma (2006) who pointed out that teachers lack necessary competencies in using and operating educational software as well as connecting to the internet so as to source information on education. That is why Anderson (2005) advised that all the teachers should be trained to be familiar with e-leaning experiences as ongoing professional development.

Research question 3 addressed the strategies that could be adopted to improve the effective use of e-learning devices by technology teachers for teaching. From the analysis on Table 3, it was found out that the respondents strongly agreed that seminars and workshops for technology teachers, employing enough ICT teachers in secondary schools, involving public private partnership in funding e-learning programs, improving power supply and bandwidth as well as setting up monitoring team to monitor the use of available devices are effective strategies for improving the use of e-learning devices in teaching technology subjects. This finding is in line with the view of Hedge and Hayward (2004) who stated that certain things are needed to enable e-learning programmes spread fast. Such things according to Hedge and Hayward include adequate funding, increased power supply, sufficient bandwidth as well as well trained ICT teachers.

The hypothesis stated that there was no significance difference between the mean ratings of male and female technology teachers in the use of e-learning devices. The result in Table 4 showed that the calculated t- value was less than the critical value of 1.96 at 0.05, level of significance and so the null hypothesis was upheld. This implies

that male and female technology teachers did not differ in their mean responses on the problems encountered in the use of e-learning devices. This means that both male and female technology teachers encounter the same problems in the use of e-learning devices.

CONCLUSION

The study addressed the availability of e-learning devices and strategies for improvement in secondary schools in Anambra state. The findings showed that some of the devices needed in e-learning are still lacking such as internet connectivity, laptops for teachers as well as basic software. Even where computers are found in the secondary schools, the teachers encounter lot problems in their usage. Such problems include irregular power supply, low computer literacy on the part of teachers, and lack of internet connection.

However the use of e-learning in teaching technology subjects in secondary schools in Anambra state would be realized if certain strategies are put in place. Such strategies as seminars and workshops for teachers, increasing bandwidth, improving power supply, provision of adequate e-learning infrastructural facilities, setting up a monitoring team to monitor the use of available devices as well as involving public private partnership in the funding of e-learning programs. As Nigeria joins the rest of the world in the transformation of the education sector through e-learning, it has become imperative for teachers of technology subjects to be adequately prepared in the area of ICT.

RECOMMENDATIONS

Based on the findings, the following recommendations are made

1. Seminars and workshops should be organized regularly by Anambra State ministry of education for pre-service and in-service teachers to make them develop positive attitude towards e-learning.

2. Federal and State Governments should partner with schools to fund e-learning programmes.
3. The State ministry of education should set up monitoring team to monitor the use of the available e-learning facilities.
4. Efforts should be made by the Federal Government to supply of electricity continuously to schools.
5. Anambra State Government should make Laptops readily available to all teachers.
6. Adequate e-learning facilities should be provided by the State Government to improve teaching and learning.

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