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Computer Science Educators and their Extent of Utilization of e-Learning Teaching Strategies in Colleges of Education in South-South, Nigeria

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Abstract

The study determined the extent of utilization of e-learning teaching strategies by Computer Science Educators in Colleges of Education in South-South, Nigeria. Two research questions guided the study while four null hypotheses were formulated and tested at 0.05 level of significance. A descriptive survey design was adopted. A total of 219 Computer Science Educators from 10 Colleges of Education in South-South, Nigeria made up the population of the study. There was no sampling as the population size was manageable by the researcher. A structured 20-item validated questionnaire was used for data collection. Three experts validated the instrument and an overall reliability correlation co-efficient of 0.79 was obtained using Cronbach Alpha method. Out of the 219 copies of the instrument distributed, 210 copies were successfully retrieved and used for data analysis. Data related to the research questions were analyzed using mean and standard deviation while z-test statistic was used to test the null hypotheses. The findings from the study revealed that blended learning tools were utilized as e-learning teaching strategies but to a moderate extent, while telecommunication was utilized to a small extent. The study also revealed that type of ownership of institutions i.e., state or federal, do not significantly affect the utilization of e-learning teaching strategies (blended learning and telecommunication) by Computer Science Educators in Colleges of Education in South-South, Nigeria. It was concluded that Computer Science Educators utilized blended learning tools as teaching strategies to a moderate extent as a

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result of insufficient training and retraining given to them, but telecommunication tools were utilized to small extent. To encourage the use of e-Learning teaching strategies by Computer Science Educators, it was recommended, among others, that Computer Science Educators should develop themselves by way of in-service training. They should also constantly use e-Learning tools provided by the government through the administrators of institutions in carrying out their teaching tasks.

Keywords: *e-Learning, teaching strategies, utilization, blended learning, telecommunication, Computer Science Educators.*

Introduction

The 21st Century has witnessed the advancement of learning technologies especially that of electronic learning. Ogboanugo (2016) defined e-Learning as the use of various kinds of electronic media and Information and Communication Technology (ICT) in teaching & learning. According to Eze, Chinedu-Eze and Bello (2018), e-Learning incorporates all educational activities that are carried out by individuals or groups working online or offline, and synchronously or asynchronously via networked or stand-alone computer and other electronic devices. This can be achieved when teaching and learning involve blended learning approaches. It has been shown that a single mode of instructional delivery system may not provide sufficient choices, engagement, social contact, relevance and context needed to facilitate successful learning and performance (Harvey, 2003; Carner, 2010). This accounts for why organization and institutions continue to explore strategies for effective learning for improved performance. In doing this, they have to consider a variety of issues to ensure effective delivery of learning that will ensure a high return on investment. Garrison and Vaughan (2008) opined that organizations and institutions must use a blend of learning strategies to get the right content in the right format to the right people at the right time. Kamba (2012) however, identified two basic e-learning teaching strategies which could effectively be utilized to improve teaching and learning in educational institutions. These according to Kamba include blended learning and telecommunication teaching strategies.

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Blended learning is important because it provide the opportunity for students to follow an individualized learning plan. This is particularly helpful to students who need to dedicate more time to understanding a specific topic area, at-risk students who need a specialized plan to get back on track to graduate or advanced students who need a quicker pace to remain fully engaged. Individualized learning creates an educational path for students to address their specific needs and prepare them for graduation and success beyond high school. Blending as a teaching-learning model offers opportunity to improve upon prevalent pedagogical practices. For example, in the on-campus environment, much of the teaching and learning is still focused on the transmission model with the lecture method used by 83 percent of higher education instructors as the predominant teaching strategy (U.S. Department of Education, in Wagner, Hassan and Head, 2008). Santrock (2007) expressed that telecommunication changes not only the way students learn, but also when they learn, where they learn and who teaches them. Through telecommunication, the typical classroom is no longer bound by four walls, but open to include interaction among students, teachers and experts from around the word (Ziewer & Seidl, 2011). Learning experiences can be shared from many varied sources.

Telecommunication is a means of exchange of information over significant distance by electronic means as opined by Ziewer and Seidl (2011). Some business educators in schools have been provided with this e-Learning strategy but the extent to which they are used is still unknown while in some schools they are not provided. Horton in Bupo and Ndinechi (2015) pointed out that the use of mobile smart phones, interactive television, podcasting, video conferencing, computer aided assessment and satellite cable among others would improve learner-centered learning. There seem to be a disparity in how Computer Science Educators utilize telecommunication tools as teaching strategy. To effectively achieve the goals of Computer Science Education program especially in colleges of education, there is need for the educators to adopt appropriate teaching strategies in their instructional delivery.

According to Batubo, Digitemie and Nelly (2008), strategies offer a framework within which an organization defines possible means of achieving its goals and objectives. The objective of every strategy is to put the organization in a position to carry out its mission effectively and efficiently. Teaching strategies thus refer to specific ways or action plans that could be adopted to

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improve teaching and learning (Ekpenyong, 2011). Teaching strategies involve the use of variety of teaching methods and techniques. The fundamental importance of teaching strategies is to make it easier to implement a variety of teaching methods and techniques. Teaching strategies that could be adopted to enhance the process of teaching for learning include blended and online learning, brainstorming, case studies, debates, problem solving, flipped classroom, questioning, simulations and teaching diverse groups.

Electronic learning tools as teaching strategies appear to be poorly utilized in Nigerian tertiary institutions. Inije, Utoware and Kren-Ikidi (2013) reported that poor utilization of e-learning tools as teaching strategy was as a result of shortage of qualified staff with e-learning application, lack of e-learning facilities and infrastructure, as well as none training and retraining of lecturers to acquaint them with the development of new technologies. It appears that Computer Science Educators in many Colleges of Education still do not have basic training and retraining on the use of e-learning tools; cannot operate a computer and have little knowledge of e-learning platforms. As posited by Ohakwe and Njoku (2010), e-learning utilization is influenced by Computer Science Educators' computer literacy, adequate fund available to schools for training of their teachers in e-learning skills, lack of equipment and electronic devices, and constant electric power failure forms the basis for e-learning integration. Others rely on traditional mode of teaching and learning. The importance of these e-Learning tools cannot be over emphasized. Blended learning and telecommunication tools for teaching strategies would lead to better teaching and learning processes which is learner-centered. Utilization of e-learning in this study therefore, means the level of the applications of e-learning method and resource in Colleges of Education. The emphasis basically is with how many different e-learning resource is in use by these institutions and to what extent each of the e-learning resource is used.

The influencing factors in the utilization of e-Learning tools as teaching strategies in Computer Science Education could be gender and ownership of institutions. Gender to this research study means male and female Computer Science Educators in Colleges of Education. Murphy and Greenwood in Sharda (2010) reported that age and gender effects could be factors in determining the extent of the low teacher adoption of e-Learning tools for instructional delivery. In the same vein, Paula (2010) suggested that male educators experience less anxiety about e-

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Learning and make more frequent use of it. Similarly, institutions ownership could influence the use of e-Learning strategies in Computer Science Education. Okiki (2011) pointed out that the use of e-Learning is influenced by the stakeholders. As noted by Volman and Van Eck, (2001) one of the stakeholders is the educational institutions. Others include the students, the instructors, content providers, technology providers, accrediting bodies and employees. The government owned and privately owned tertiary institutions may differ in the way e-learning facilities are provided for them (Leem & Lim, 2007). Manir (2009) also noted that the use of e-learning strategies has begun in government tertiary institutions. Okebukola in Okoro (2008) stressed that e-Learning tools are not part of classroom technology in over 90 percent of tertiary institutions in Nigeria. Thus, the chalkboard and textbooks continue to dominate classroom activities. Computer Science Educators them self needs training in areas of e-learning competences to be able to integrate e-Learning tools efficiently and effectively in their teaching tasks.

Computer Science Education according to Edhuze (2013) involve teaching and inculcating in the learner the basic skills required to independently manipulate the computer to achieve educational goals. The author further stated that Computer Science Education is aimed at making students acquire skills and competencies required in this digital word of competitiveness. Such basic skills and competencies upon graduation make them conversant with term and practices embedded in the world of computer. Computer Science Education is therefore organized to enable people understand the function, uses and limitations of the computer and to provide an opportunity for the study of the modern methods of information processing.

The usage of e-learning tools as teaching strategies by Computer Science Educators in Colleges of Education will lay the foundation for computer and software utilization in the business environment by Computer Science Education students. It seems to the researcher that the extent to which Computer Science Educators in Colleges of Education utilize e-learning tools as teaching strategies has not been sufficiently established, and that necessitated this study. This study is thus focused on determining the extent of utilization of e-learning tools as teaching strategies by Computer Science Educators in Colleges of Education in South-South, Nigeria.

Statement of the Problem

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There appears to be under-utilization of electronic devices as teaching strategies for educational purposes by Computer Science Educators. Inije, Utoware and Kren-Ikidi (2013) held that under-utilization of e-learning tools as a teaching strategy was as a result of shortage of qualified staff with e-learning application, lack of e-learning facilities and infrastructure, lack of training and retraining of lecturers to acquaint them with the development of new technologies, among others. It could result to teaching and learning continuing to be teacher–centered rather than learner-centered. It could also hinder collaborative, active and lifelong learning. Manir (2009) pointed out that lack of computer culture among educators will impede the integration of new technologies in the educational process. The problem of the study therefore is the seeming gap existing in the availability and utilization of e-learning facilities in the teaching and learning processes in our Colleges of Education. It is consequently the interest of this study to identify the perceived gap and proffer possible solution as necessary.

Purpose of the Study

The purpose of this study was to determine the extent of utilization of e-learning teaching strategies by Computer Science Education lecturers in Colleges of Education in South-South, Nigeria. Specifically, the study determined the extent of utilization of:

1. Blended learning tools as e-learning teaching strategies by Computer Science Education lecturers in Colleges of Education in South-South, Nigeria.
2. Telecommunication tools as e-learning teaching strategies by Computer Science Education lecturers in Colleges of Education in South-South, Nigeria.

Research Questions

The following research questions guided the study:

1. To what extent do Computer Science Education lecturers utilize blended learning tools as e-learning teaching strategies in Colleges of Education in South-South, Nigeria?
2. To what extent do Computer Science Education lecturers utilize telecommunications tools as e-learning teaching strategies in Colleges of Education in South-South, Nigeria?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

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1. There is no significant difference in mean ratings of Computer Science Education lecturers in the extent they utilize blended learning tools as e-learning teaching strategies in Colleges of Education in South-South, Nigeria.
2. There is no significant difference in mean ratings of Computer Science Education lecturers in the extent they utilize telecommunications tools as e-learning teaching strategies in Colleges of Education in South-South, Nigeria.

Method

The study adopted the descriptive survey research design. The population for the study consists of 219 Computer Science Education lecturers from 10 Colleges of Education (3 federal and 7 state) in South-South, Nigeria. There was no sampling in this study since the population size was manageable. The instrument for data collection was a structured questionnaire titled Utilization of e-Learning Tools as Teaching Strategies by Computer Science Education Lecturers (UE-LTSCEL). The questionnaire was structured on a five-point rating scale of Very High Extent (VHE), High Extent (HE), Moderate Extent (ME), Low Extent (LE) and Very Low Extent (VLE). Face validity of the instrument was established using the opinion of three experts as they validated the instrument. To establish the internal consistency of the instrument, the Cronbach Alpha formula was used to analyze the data using the Statistical Package for Social Sciences (SPSS) version 21 and obtained reliability coefficient values of 0.79 and 0.84 for the two clusters with an overall reliability coefficient value of 0.82. Out of the 219 copies of the instruments administered on the respondents, a total of 210 copies (representing 97.33 percent) were retrieved and were used for data analysis. Data collected regarding the research questions were analyzed using descriptive statistics (mean and standard deviation) for the two research questions. The z-test statistic was used to test the null hypotheses. The decision rule regarding the research questions were based on the real limit of numbers. With reference to the research questions, the decision was that items with mean ratings of 4.50-5.00 were regarded as “very high extent”. Mean ratings from 3.50-4.49 were considered as “high extent”. Mean ratings that range from 2.50-3.49 were regarded as “moderate extent”. Mean ratings from 1.50-2.49 were regarded as “low extent”, while mean ratings between 0.50-1.49 were regarded as “very low extent”. The null hypothesis was rejected where

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the calculated z- value was equal to or greater than the critical z- value: otherwise, the null hypothesis was not rejected.

Results

Research Question 1:

To what extent do Computer Science Education lecturers utilize blended learning tools as e-learning teaching strategies in Colleges of Education in South-South, Nigeria?

Table 1:

Computer Science Education Lecturers mean rating on the extent of utilization of blended learning tools as teaching strategy in tertiary institutions in south-South, Nigeria (N =210).

S/N	Blended Learning Facilities	Mean	SD	Remarks
1	Computer (laptop & desktop)	3.01	1.28	Moderate Extent
2	Web Cam	2.40	1.37	Low Extent
3	Power point office suit software	3.03	1.32	Moderate Extent
4	Educational software	2.79	1.38	Moderate Extent
5	Word processing	2.85	1.28	Moderate Extent
6	Virtual classroom	2.52	1.43	Moderate Extent
	Mean of Means	**2.85**		**Moderate Extent**

The data shown in Table 1, indicated that all the items but one, were used to a moderate extent with mean ranging from 2.52 to 3.03 respectively, while the result showed that only web cam was used to a low extent with mean of 2.40. The mean of means revealed that Computers Education utilized blended learning tools as a teaching strategy to a moderate extent with a mean of means score of 2.85.

Research Question 2

To what extent do Computer Science Education lecturers utilize telecommunications tools as e-learning teaching strategies in Colleges of Education in South-South, Nigeria?

Table 2:

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Computer Science Education Lecturers mean rating on the extent of utilization of telecommunication tools as teaching strategy in tertiary institutions in South-South, Nigeria (N =210).

S/N	Telecommunication Facilities	Mean	SD	Remarks
7	Mobile/smart phone	2.77	1.43	Moderate Extent
8	Interactive Television	2.56	1.42	Moderate Extent
9	Podcasting	2.48	1.41	Low Extent
10	Video Conferencing	2.64	1.35	Moderate Extent
11	Computer aided assessment	2.85	1.28	Moderate Extent
12	Optical Fiber to aid teaching	2.70	1.35	Moderate Extent
13	Satellite cable to aid teaching	2.44	1.44	Low Extent
	Mean of Means	**2.16**		**Low Extent**

The data shown in Table 2 shows that Computer Science Education lecturers utilized Mobile/Smart Phone, Interactive Television, Video Conferencing, Computer Aided Assessment, Optical Fiber to a moderate extent with mean ranging from 2.56 to 2.77 respectively, while the result showed that Satellite and Podcasting was used to a low extent ranging from 2.44 to 248. The mean of means revealed that Computer Science Education lecturers used telecommunication tools as e-learning teaching strategy to a low extent with a mean of means score of 2.16.

Null Hypothesis 1

There is no significant difference in the mean ratings of Computer Science Education lecturers in the extent they utilize blended learning tools as e-learning teaching strategies in Colleges of Education in South-South, Nigeria.

Table 3:

z-test result analysis of Computer Science Education lecturers on the extent they utilize blended learning tools as teaching strategies for e-learning in Colleges of Education in South-South, Nigeria.

Gender	N	Mean	SD	α	Df	z-cal	z-crit	Decision

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Federal	86	3.08	1.31					
				0.05	208	1.75	1.96	Not Significant
State	124	2.62	1.27					

Table 3 indicated that the z-calculated value of 1.75 is less than the z-critical value of 1.96 at a degree of freedom of 208. Therefore, the null hypothesis is not rejected; hence, there is no significant difference in mean ratings of male and female Computer Science Education lecturers in the extent they utilize blended learning tools as e-learning teaching strategies in Colleges of Education in South-South, Nigeria.

Null Hypothesis 2

There is no significant difference in the mean ratings of Computer Science Education lecturers in the extent they utilize telecommunications tools as e-learning teaching strategies in Colleges of Education in South-South, Nigeria.

Table 4:

z-test result analysis of male and female Computer Science Education lecturers on the extent they utilize telecommunication tools as teaching strategies for e-learning in Colleges of Education in South-South, Nigeria.

Gender	**N**	**Mean**	**SD**	***α***	**Df**	**z-cal**	**z-crit**	**Decision**
Federal	86	2.02	1.22					
				0.05	208	1.28	1.96	Not Significant
State	124	2.18	1.15					

Table 4 indicated that the z-calculated value of 1.28 is less than the z-critical value of 1.96 at a degree of freedom of 208. Therefore, the null hypothesis is not rejected; hence, there is no significant difference in mean ratings male and female Computer Science Education lecturers in

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the extent they utilize telecommunication tools as e-learning teaching strategies in Colleges of Education in South-South, Nigeria.

Discussion

Findings of the study revealed that Computer Science Education lecturers in Colleges of Education in South-South, Nigeria utilized blended learning tools as teaching strategy to a moderate extent. The results showed that business educators used the plasma screen to aid teaching and learning at a low extent with a mean of 2.40. More so, the findings also showed that Computer Science Education lecturers used power point and computer for educational processes especially in assessing students' project work presentation. This is in agreement with support findings of Manir (2009) that there was tremendous growth of computer equipment and internet usage by lecturers and students of Nigerian tertiary institutions. The findings are also in consonance with Osuafor and Emeji (2015) whose studies revealed that science teacher educators use blended learning facilities to a moderate extent. The findings however, differ from that of Inije, Utoware and Kren-Ikidi (2013) whose earlier study revealed that e-learning technology resources were lowly utilized in teaching business education in the Colleges of Education due to many challenges which include shortage of qualified staff with e-learning application, lack of e-learning facilities and infrastructure in the Colleges of Education.

Findings of the study indicated that Computer Science Education lecturers utilized telecommunication tools such as mobile/smart phone, interactive television, video conferencing, computer aided assessment and optical fiber to a low extent. This finding is in agreement with Santrock (2017) whose study revealed that there was little or no use of telecommunication for teaching and learning, due to lack of electricity in substantial part of the country. However, it must be emphasized that telecommunication tools can be an invaluable tool for effective teaching of computer-related courses in tertiary institutions, Colleges of Education inclusive. It is against this background that Ziewer and Seidi (2011) opined that schools should train their graduates towards responding to business and environmental requirements of the 21st century by effectively using various e-learning tools in instructional delivery.

Conclusion

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Based on the findings of the study, it was concluded that Computer Science Education lecturers from Colleges of Education in South-South, Nigeria utilized blended learning tools as teaching strategy to moderate extent as a result of insufficient training and retraining given to them, while they utilized telecommunication tools as teaching strategy to low extent. The outcome of the study also revealed that gender and ownership of institutions did not affect the extent of utilization of e-learning tools as teaching strategies by Computer Science Education lecturers as an instructional delivery in Colleges of Education in South-South, Nigeria.

Recommendations

Based on the findings and conclusion drawn from the study, the following recommendations are made:

1. Computer Science Education lecturers should realize that a lot of changes are going on in education and the business world, therefore should develop themselves and constantly use e-Learning tools as teaching strategies in teaching tasks.
2. In–service training programmes such as seminar, in–service course, conferences and workshops on the use and operation of new learning technologies should be made compulsory for all Computer Science Education lecturers from Colleges of Education in South-South, Nigeria.
3. Computer Science Education lecturers from Colleges of Education in South-South, Nigeria should basically be involved in the use of e-learning tools provided by the government and administrators of institutions in teaching tasks.
4. The government at all levels should endeavor to increase the budgetary allocation for Colleges of Education so as to enhance adequate procurement of e-learning facilities for teaching and learning.

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