Virtual Classroom Instruction and Undergraduate Students' Academic Performance in Educational Technology, University of Calabar

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Abstract

This study investigated the use of virtual classroom instruction on students' academic performance in Educational Technology in the University of Calabar. Three hypotheses were formulated to guide this study and quasi-experimental research design was employed for the study. A sample of 72 Educational Technology Students was selected for the study using the purposive sampling technique. Thirty six (36) respondents were used for experimental group and remaining thirty six (36) were used as control group. A performance test and questionnaire were used for data collection and independent t-test was used to analyze the data. The result of the analysis indicated that utilization of virtual classroom instruction influenced students' academic performance in Educational Technology. It was, therefore, recommended that the use of virtual classroom instruction should be encouraged to boost instructional delivery and optimize students' academic performance in Educational Technology and other courses in the curriculum.

Keywords: Virtual classroom, Instructional materials, Academic performance, Undergraduate students, University of Calabar, Quasi-experimental design.

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Introduction

In this era of globalization, technological advancement has increased dramatically in every sphere of life including education. These advances have introduced new educational nomenclatures like 'virtual education, virtual classroom, virtual universities, online courses, electronic and cyberspace institution as well as new approaches to learning. Profound investment in technology in this decade has given rise to a worldwide explosion of information. Many educational institutions are driven by the desire to use newly found access to global

data communication. This has increased enrolment and the award a multiple range of degrees through massive investments in distance education programmes.

Virtual classroom has taken a leading role in the teaching-learning process. Generally, the virtual classroom is a learning environment located within a computer mediated communication system. It consists of a set of group communication and work "spaces" and facilities that are constructed in software. Virtual learning resources are simply online version of lecture notes rather than a source of additional information to further their understanding. Developments in information communication technologies (ICTs) have been rapid in recent years and have promised improved education and training to an increasingly diverse group of students. Specifically, the exponential growth in the internet has opened higher education to new, diverse audience and allows universities to establish fresh markets in geographically distant areas. Widening access to tertiary education means an increasingly competitive market for graduate learning. Indeed, today's technology is a tool used to remove geographical barriers and expose everybody to learn anytime and anywhere without the presence of a lecturer.

In order to equip students with the necessary skills and knowledge to foster the growth of independent, creative and lifelong learners, most higher education institutions are beginning to provide virtual learning environment or virtual learning space in which learners and teachers communicate online and learning

takes place through electronic means. Teaching materials such as university services and functions are "simulated on the internet so that no physical interaction will be needed any more to complete a study programme (Barjis, 2003). Hence, the availability of relevant virtual learning has never been more important than now.

Virtual schools are of two broad categories i.e., independent collaboration and broadcast. According to Russell (2001), independent models can often be referred to as "asynchronous" because they do not rely upon direct communication between teacher and students, as they do not avail of chat or video more communication and collaboration through video conferencing and live chats. Broadcasts, models allow students to access lecture or broadcasts on the internet. All these models offer a wide range of learning flexibility in virtual environment that serve the individual needs of the learners regardless of their age, gender, religion, nationality or disability.

Virtual classroom is very common in this modern era. Many developed countries are using virtual classrooms to provide online education to the students. As the world is being developed with the new technologies, discovering and manipulating new ideas and concepts of doing work are changing rapidly. There have been many researchers in the area of virtual education and many of them have been successfully implemented. Some of the virtual classrooms are getting positive feedback for providing quality education, while the traditional classroom which is stereotyped in its

activities and mode of instructional delivery is lagging and becoming incessantly boring. That is because, in a traditional classroom setting, students are made to sit passively while the teacher delivers a lecture. Students focus is set in the wrong direction like taking notes rather than understanding and absorbing new concepts, which results in student's inability to grasp key ideas and concepts and realize lesson objectives. Above all, there is too much focus on presentation with little or no time left for practice. Since the teacher has to deliver a fixed number of concepts within a limited time, most classroom activities are geared towards the presentation stage only, while practice is left for the students to do as homework.

A really good teacher can make the traditional classroom an exciting place, and the same is true for the virtual classroom. The specific goals of any class, or course, must be clear in the mind of the teacher, as well as the best methods for the type of classroom and type of content presented. Traditional classroom requires everyone travel time for interaction. Larger class sizes limit the opportunity for interaction and the true individual attention students' receive. Private interaction between teacher and students is often severely limited in a busy classroom. Due to diversity of background, attitude and other factors, the ideal of Socratic small group interaction at a high level is often beyond practical attainment in many traditional classrooms.

The impact of learning environments in relation to learning outcomes has constantly been explored by researchers of education. Web-based technology has noticeably transformed the learning and teaching environment. Proponents of online learning have seen that it can be effective in potentially eliminating barriers while providing increased convenience, flexibility, currency of materials, customized learning and feedback as against the traditional face-to-face experience (Harasim, 1990; Hacbaith, 1996; Kiser, 1999; Matthews, 1999; Swan et al., 2000; Effiong and Ekpo, 2016; Etim, Upula, and Ekpo, 2016; Udosen and Ekpo, 2016).

An important component of the classroom is the social and communicative interactions between student and teacher, student and student. A student's ability to ask a question, share an opinion or to disagree with a point of view are fundamental learning activities. It is often conversation, discourse, discussion and debate among students and between instructors and student's that a new concept is clarified, an old assumption is challenged, a skill is practiced, an original idea is formed and encouraged and ultimately, a learning objective is achieved. Online learning requires adjustments by instructors as well as students for successful interactions to occur. Online courses often substitute classroom interaction with discussion boards, synchronous chat, electronic bulletin boards and e-mails.

The effectiveness of such a virtual interactive venue is not without debate. Student-to-instructor and student-to-student interactions are important elements in the design of a web-based course

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(Sherry, 1996) because learners can experience a sense of community, enjoy mutual interdependence, build a sense of trust, and have shared goals and values (Rovai, 2002, Davies & Graff, 2005). The teaching of various disciplines in a class has already moved beyond the use of blackboard and chalk into using simple computer programs such as, Microsoft PowerPoint to facilitate the delivery of education. In this context, Mairi and Shahid (2005), studied the views of two student-groups comparing the traditional way of teaching with blackboard against the one using PowerPoint. The findings suggests that teaching with the help of such software as PowerPoint helps students understanding of a topic and is considered more fun thereby triggering student attention and resulting ultimately into better student performance in their academic pursuits.

More recently, Sidiropoulons (2008) studied the use of the virtual learning environment during teaching the macroeconomics module offered by the University of Macedonia (Thessalonica and Greece). The study adopted a similar methodological approach using a group of students' taught in the conventional way as control and another group taught by the use of an online Platform ADLSE. Once again, the results reflect the very positive views of the respondents towards the new technology ADLSE. Furthermore, it should be noted that the use of this platform contributed to student performance because students taught by this platform were found to do better than students who were taught by the conventional means.

Burns (2013) in her report on BBC News education identified that lack of computer ownership due to poverty also causes poor performance at school. According to Van Disk (2012), motivation to own a computer increases fast due to largely technological diffusion in the society. Hence students are motivated and compulsion in some instance by faculty to own a computer as a prerequisite to their registration as university students and these show a great deal in their computer ownership as the university is moving towards a smart society.

Dayo (2015), bothered by the perennial failure of students in senior secondary school certificate examinations, SSCE, and Unified Tertiary Matriculation Examination, UTME, online learning platform has been launched to enhance their performance. It can be recalled that in 2012, 2013, 2014, 61, 63, and 70 percent of students who sat for WAEC failed woefully. Also, out of the 1.7million students who register annually for tertiary examination conducted by the Joint Admission and Matriculation Board, JAMB, only 500,000 of them get admission in Nigerian universities. Worried by this downward trend in students learning, Lagos State government introduced free online systems to assists its student in performing well academically. The aim of the project was to present difficult topics in the secondary school curriculum in a learner-friendly manner using online learning and social media protocols to boost the performance of secondary school students in public

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examinations especially the SSCE, NECO and UTME. The project take advantages of the availability of mobile phones that students have in the states as not less than two-thirds of secondary school students have the mobile phones. The potential of these hand held devices is waiting to be tapped for in teaching and learning. Okebukola who pointed out that a good number of secondary school students are addicted to social media interactions noted that online core subjects will be offered through the platform of face book and twitter. He maintained that since students congregate around such media, it is helpful to embed teaching and learning of perceived difficult topics into their use so that students can be served with their wants.

DeLange (2003) investigated the student views on the tool Web CT that is a learning tool in the virtual environment. Specifically the studied the relationship between learning in a virtual environment and motivating students. The survey results showed that students' satisfaction of the virtual environment is directly related to the availability of on-line lectures, the frequency on the usage of bulletin board, assignment and evaluation of on-line work, chat and video. Furthermore, Dunbar (2004) discussed the conversion of an accounting course with WebCT technology. The study included students who attended the course with WebCT technology. The study focused on student frequency of using learning tools, students view on how they could improve the learning tools, information on the use of modern classrooms and desired manner of virtual instruction in order to improve educational experience.

Another problem associated with the traditional method of teaching is the approach of one-size-fit-all, not every student has the same pace of learning, while some students can follow the teacher's lecture with convenience, most of the others require time to chow on the information that they are getting. Also, each student has a different learning style. One can't expect a kinesthetic learner to master the concept by just listening to a lecture. If a visual learner gets worse grades than an auditory learner, it doesn't mean that the visual learner is slow or dull, it might simply mean that the classroom strategies were designed for the auditory learner only. It is against this background that the researchers identify The Use of Virtual Classroom Instruction and Students' Academic Performance in Educational Technology, Faculty of Education, University of Calabar, as an area of concern.

Statement of the problem

Technology has increasingly become an integral part of our lives, so much that it seems preposterous to even think of doing the most simple, routine tasks without the use of a cellular phone, laptop computer or personal global positioning system, more commonly known as GPS. While people of all ages increasingly use technology for routine tasks, students are among the most frequent users of technology. Just as technology has changed all aspects of our daily lives, it is undoubtedly changing education at a lightning speed.

In a conventional classroom, there is usually hassle for lecture space or venue, class duration is fixed and usually not extendable. Students are made to sit passively as captive audience and tense while the teachers deliver the lecture. Students focus on taking notes rather than understanding and absorbing new concepts, which results in students' inability to grasp key ideas and concepts resulting in unattainable lesson objectives. Conventional classrooms are mostly not well equipped to accommodate large classes, and only those who sit in front hear what the instructors have to say, and leaving those behind to gaze at the instructor's lips trying to grasp what he or she is saying. Classrooms are usually overcrowded and not well ventilated, thus not making the classroom conducive for students to stay and at such learning cannot take place. Can the utilization of virtual classroom instruction improve students' academic performance in educational technology?

This study is also aimed at finding out how the utilization of the virtual classroom can encourage interactive, creative and active learning environment mostly in educational technology courses in the department of Curriculum and Teaching, Faculty of Education, University of Calabar, Calabar.

Purpose of the study

The main purpose of the study is to find out whether the use of virtual classroom instruction have any significant effect on the academic performance of students in Educational Technology in University of Calabar. Specifically the study aims at:

1. Ascertaining whether the utilization of virtual classroom instruction has any influence on students' academic performance in Educational Technology.
2. Determining whether students perform better academically with virtual classroom instruction or traditional classroom instruction.
3. Identifying whether the frequency use virtual classroom instruction has any significant influence on students' academic performance in Educational Technology.

Research questions

The following research questions were formulated for the study:

1. How does the utilization of virtual classroom instruction influence students' academic performance in educational technology.
2. What is the difference in the academic performance of students in educational technology taught with virtual classroom instruction and those taught with conventional classroom instruction?
3. How does the frequency of use of virtual classroom instruction influence students' academic performance in educational technology?

Research hypothesis

The following hypotheses were formulated for this study:

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1. The utilization of virtual classroom instruction has no significant influence on and students' academic performance in Educational Technology.
2. There is no significant difference in academic performance between students in Educational Technology and those taught with virtual classroom instruction and those taught with the traditional classroom instruction.
3. The frequency on the use virtual classroom instruction has no significant influence on students' academic performance in Educational technology.

Research design

This research design for this study is a quasi-experimental research design aimed investigating the influence of virtual classroom instruction students' the academic performance in educational technology, in the University of Calabar. In carrying out this study, the researchers adopted the quasi experimental approach. This is because the experimental research involves observation of situation as it is and setting up experiment condition or collection of group to different treatment. The survey research design was also used to get information on the availability and students' frequent use of information communication technology (ICT).

Population of the study

The population for the study comprised of all the 2014/2015 Educational Technology students in the University of Calabar, totally two hundred and twenty two (222) students.

Sampling technique

The selection was done using purposive sampling technique. The 2014/2015 second year students of educational technology were purposively selected and randomly assigned to experimental and control groups.

Sample

The sample of the study consisted of all the 2014/2015 second year students of Educational Technology numbering seventy two (72) students. Thirty six (36) were randomly assigned to the experimental group, while the other 36 were assigned to control groups.

Instrumentation

The ETPST was used to determine the performances of students. It has 20 multiple choice items with each item having four options lettered A-D. Each correct answer was scored 5 marks and incorrect answer zero (0), giving a maximum of 100 marks and a minimum zero (0). The frequency of utilization of virtual classroom instruction questionnaire (FUVCIQ) was also used. This performance test and questionnaire was administered on both the experimental and control groups.

In addition, lesson note was prepared by the researcher for the control group, and an instructional package for the experimental group on the topic educational technology: Processes and Settings. The instructional package for the experimental group was developed

using the ASSURE Model. The model served as a procedural guide for designing and conducting instruction that incorporate learning and technology. The package consisting of 5 slides highlighted the design elements of colour, light, lettering slides and sound, which are introduced to sustain learner's attention during the lesson. The questionnaire was also used to determine the level of online collaboration such as chat, text, audio, video etc. and how frequently students accessed the internet.

Method of Data Analysis

On method of data preparation, data obtained were scored by the researchers and categorized into high and low. Those who scored the midpoint of 10 and below were considered as low, while those that scored 11 above were considered as high. All data obtained were collated and subjected to data analysis using independent t-test statistics.

Findings

The utilization of virtual classroom instruction has no significant influence on students' academic performance in Educational Technology. Independent t-test analysis was employed in the analysis of data collected in respect to this hypothesis. The reason for adopting this statistical technique is that utilization of virtual classroom instruction was measured categorically. The hypothesis was tested at .05 level of significance. The summary of the result obtained from the analysis is as presented in Table 1.

TABLE 1
Independent t-test analysis of the influence of utilization of virtual classroom instruction and students' academic performance in Educational Technology (N= 72)

Utilization of virtual classroom instruction	N	$\bar{X}$	SD	Cal. T
High	36	73.51	9.25	
				11.26
Low	36	69.31	8.12	

Significant at 0.05 level, df= 70, critical t = 1.994

The summary of result presented in Table 1 indicated that the calculated t-value of 11.26 is greater than the tabulated t-value of 1.994 at 0.05 level of significance and 70 degrees of freedom. The table further shows that the mean academic performance of students with high utilization of virtual classroom instruction was higher than that of their counterparts with low utilization of virtual classroom instruction. The

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implication of this result is that there is a significant influence of utilization of virtual classroom instruction and students' academic performance in Educational Technology in the University of Calabar.

Hypothesis two

There is no significant difference in the academic performance of students in Educational Technology between those taught with virtual classroom instruction and those taught through traditional classroom instruction. Therefore, independent t-test analysis was used to test this hypothesis. The hypothesis was tested at 0.05 level of significance. The summary of the result obtained from the analysis is as presented in Table 2.

TABLE 2
Independent t-test analysis of the difference between the academic performance of students in Educational Technology taught with virtual classroom instruction and those taught without virtual classroom instruction
(N= 72)

Classroom instruction	N	$\bar{X}$	SD	Cal. T
Virtual classroom instruction	36	87.24	7.82	
				9.99
Traditional classroom instruction	36	60.18	8.29	

Significant at 0.05 level, df= 70, critical t = 1.994

The summary of result presented in Table 2 revealed that the calculated t-value of 9.99 is statistically greater than the tabulated t-value of 1.994 at 0.05 level of significance and 70 degrees of freedom. The table further indicated that the mean academic performance of students taught with virtual classroom instruction. The implication of this result is that there is a significant difference between the academic performance of students in Educational Technology taught with virtual classroom instruction and those taught without virtual classroom instruction in the University of Calabar.

Hypothesis three

The frequency of use of virtual classroom instruction has no significant influence academic performance of students in Educational Technology. Data collected in respect to this hypothesis was tested using Independent t-test analysis. This is because, frequency of use of virtual classroom instruction was categorized into high frequency and low frequency. The hypothesis was tested at 0.05 level of significance. The summary of the

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result obtained from the analysis is as presented in Table 3.

TABLE 3
Independent t-test analysis of the influence of frequency of use of virtual classroom instruction and students' academic performance in Educational Technology (N= 72)

Frequency of use of virtual classroom instruction	N	$\bar{X}$	SD	Cal. T
High frequency	36	73.00	6.02	
				21.37
Low frequency	36	72.08	7.11	

Significant at 0.05 level, df= 70, critical t = 1.994

The summary of result presented in Table 3 shows that the calculated t-value of 21.3 is statistically greater than the tabulated t-value of 1.994 at 0.05 level of significance and 70 degrees of freedom. The table further revealed that the mean academic performance of students taught with high frequency of use of virtual classroom instruction was significantly higher than that of their counterparts taught with low frequency of use of virtual classroom instruction. The implication of this result is that there is a significant influence between frequency of use of virtual classroom instruction and academic performance of students in Educational Technology in the University of Calabar.

Summary of findings

Based on the results obtained from the statistical analysis of data, major findings were summarized thus:

1. That there is a significant influence of utilization of virtual classroom instruction on students' academic performance in Educational Technology in the University of Calabar.

2. There is a significant difference between the academic performance of students in Educational Technology taught with virtual classroom instruction and those taught without virtual classroom instruction in the University of Calabar.

3. There is a significant influence of frequency of use of virtual classroom instruction on academic performance of students in Educational Technology in the University of Calabar.

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Conclusion

Based on the findings of this study, the following conclusions were made:

That virtual classroom instruction enhances students' understanding hence, students' taught with virtual classroom instruction perform better than their counterparts taught without them. Moreover, frequent use of virtual classroom instruction the higher the academic performance of the students.

Recommendations

In line with the findings of this study the following recommendations were made:

1. Government should make provision for virtual classroom facilities to the University of Calabar and other schools to enhance the academic performance of the students.
2. Lecturers in the University and other stakeholders should be given special training on ICT to enhance their use of virtual classroom facilities.
3. Students should be equipped with the 21st ICT skills to enable them flexibility maximize the opportunities offered by the present technology driven era.

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