

Utilization of Virtual Classroom in Teaching and Learning of Computer Education Courses in Universities in Nigeria

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Key words: Virtual classroom, teaching, networking, hardware maintenance and software, universities

Abstract: This study was carried out to investigate the extent of utilization of virtual classroom in teaching and learning of computer education courses in Universities in Enugu State. The population for the study comprised of 354 respondents which include computer education students and lecturers from the three selected universities in Enugu state in Nigeria which are University of Nigeria Nsukka (UNN) and Enugu state university of Science and Technology (ESUT) and National Open University. Multi-stage sampling was used in the study: purposive sampling technique was used to select the three universities in Enugu State while simple random sampling technique was used to select forty respondents from computer and robotics education. The researchers developed a questionnaire titled “extent of usage of virtual classroom in teaching and learning of computer education courses”. The questionnaire was used to gather the needed data. Data collected was analyzed using mean and standard deviation. It was found that the use of virtual classroom significantly influence teaching and learning of Computer Courses in federal and private universities in Enugu State Nigeria. This indicates that virtual classroom is utilized for teaching and learning computer courses in universities in Enugu State Nigeria. The findings show that the student’s use virtual classroom in university of Nigeria Nsukka.

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INTRODUCTION

The classroom environment for teaching and learning has changed in this 21st century. A teacher is not always needed to emphasize verbalism before a group of student’s teach and disseminate questions to be answered and dismiss the class rather everything is now done

online^[1], said that many schools are yearning to change the traditional brick-and-mortar classrooms with a physically present teacher and look on to technology driven strategies. In the online environment, students and teachers are virtually present^[1]. A virtual classroom is an online learning environment, created using Internet, computers, so, phisticated videoconferencing devices in

which either teacher is not physically present (for remote learning) or students are not present (distance education) at the same time in the classroom^[2]. Virtual classroom is a teaching and learning environment where participants can interact, communicate, view and discuss presentations and engage with learning resources while working in groups, all in an online setting^[3]. Mallareddy, defines virtual classroom as an online learning environment that allows for live interaction between the tutor and the learners as they are participating in learning activities. In other words, the virtual classroom is a shared online space where the learners and the tutor work together simultaneously.

Virtual classroom is a tool for delivering live-learning; otherwise called "synchronous E-learning. Virtual classroom mimics the face-to-face classroom in many ways with a roster, hand-raising icon and an instructor leading the students. The virtual classroom is appreciated by students as a result of the abundant resources and free time it allow as well as autonomous study, intuitive knowledge and selective contents. Mallareddy, investigated the use of virtual classroom in teaching and noted that it was advantageous in removing the barriers of time and space, overcoming the unavailability of teachers and recording of the sessions. Gedera^[4] in an attempt to develop a better understanding of student's experiences of learning with Adobe Connect virtual classroom found that students were satisfied with the platform. Stating that in spite of the constraints of virtual classroom, most of the students preferred to have more virtual classroom activities because of the presence of cues and more human interactions.

Currently, virtual classroom is almost synonymous with the term distance education. Though students prefer the asynchronous aspects of online education which gives them the flexibility in time and in space, very few studies have proved that asynchronous delivery is a better option than synchronous delivery^[5]. The term distance education represents approaches that focus on opening access to education and training, freeing learners from the constraints of time and place. It offers flexible learning opportunities to individual and group learners. With the increased popularity of the internet, computer technologies are receiving more and more attention as a means of delivering distance learning. The primary computer technologies used for distance learning include e-Mail, online collaborations and Web-based learning^[4]. The advantages of computer technologies are: it allow self-paced instruction can incorporate text, graphics, audio and video, allow high level of interactivity, provide written record of discussions and instruction are inexpensive and worldwide accessible^[6]. The literature and studies related to distance education expanded considerably in the last years. Cinar and Torenli^[5] focused on redesigning the online courses in order to meet

the expectations of enrolled students. Isik, etc., examined postgraduate student's attitudes toward web-based distance learning and revealed general positive attitude toward distance learning. Perumalla *et al.*^[7] did a study on the effectiveness of an online course and integration of web applications in order to improve the distance learning environment when learning computer courses. Computer courses are those courses taught in the department of computer education. Computer courses are computer software, computer hardware maintenance and computer networking among others.

Computer networking is the practice of connecting computers and other hardware devices together, so that, learners can share peripheral devices, application and electronically communicate. Computer networking makes sharing of files and ideas among students and teachers easier. Computer networking can be used between teachers and students and can improve interaction and engagement with educational resources. Computer networking is today offered as a course of study in computer science, computer science education, engineering courses and other related computer courses. This is because networking is today considered as a basic component of Information Technology (IT) systems^[8]. Another computer course offered in the department of computer education is computer hardware maintenance. computer hardware maintenance deals with repairing and replacing broken and failing computer hardware^[9]. Institutions rely heavily on computer maintenance to ensure that their equipment is able to cope with school demand. Without hardware maintenance, information technology assets could cost institutions a considerable amount of money should their computers stop running/break without warning^[9]. Another computer course offered in the department of computer education is computer software. Software is a set of instructions, data or programs used to operate computers and execute specific tasks. Computer software is a generic term used to refer to applications, scripts and programs that run on a device. Software can be thought of as the variable part of a computer and hardware the invariable part^[4].

The studies by Cinar and Torenli and Isik^[1] discussed theoretical, methodological and practical implications of distance learning. In all these, the researchers reported the influence of distance education on attitude of lecturers, students as well as enhancement of effectiveness of teaching, learning and student's performance. In view of this, it becomes imperative ascertain the extent of utilization of virtual classroom and its influence on students. Virtual classroom has been found to be very effective in teaching and learning in many countries of the world. The strategy has been extended as a veritable tool in enhancing teaching and learning in a diversified form of education. Recently virtual classroom was adopted in teaching and testing of

students in institutions and examination bodies^[3]. The use of virtual classroom instruction increases in the educational and training domains, teachers have recognized the importance of evaluating its effects on student outcomes such as learning, performance and satisfaction but little effect is felt in Computer Education Departments in Enugu State Universities. This study investigated the extent of usage of virtual classroom in teaching and learning of Computer Education courses in Universities in Enugu State, Nigeria.

Statement of the problem: Virtual learning environments have grown in popularity and application in educational settings. Usage of these tools continues to grow, placing continued demand on instructional designers to develop appropriate applications of these information and communication technologies for the benefit of learners. The devices did not necessarily arise with educational purposes in mind but they find their way into educational settings, nonetheless. In order to best support learner success, online tools must be subject to pedagogical consideration and effective instructional design.

Computer teachers generally prefer the use of virtual learning classroom in teaching and learning of computer courses in university in order to reduce the rigor of mental thinking needed for student to learn. The student's active forms of learning through projects, group work, collaboration and formative evaluation are the important ways of learning in university education. These are practically and particularly key principles of learning in higher education. Students are heavily devoted on memorizing the facts rather than meaningful understanding and focusing on doing tedious and boring topics rather than creating context for meaningful learning.

Also, most of the teachers do pay less attention in higher order thinking skills, instead they simply work with pie-in-the-sky motivation. This kind of teacher centered practices of one-way traffic instruction is not working well for students to be engaged and interactive in their learning. Therefore, the new approaches of teaching using ICTs innovations in conventional mode as supplementary tools for learning in universities will help the students to learn at their individual pace and also perform excellently. The research is carried out to determine the extent of use of virtual classroom in teaching and learning of computer education courses in universities in Nigeria.

Purpose of the study: The main purpose of the study is to determine the extent of use of virtual classroom in teaching and learning of computer education courses in universities in Nigeria. Specifically, the study sought to:

- Determine the extent of usage of virtual classroom for teaching and learning networking in Universities in Nigeria
- Determine the extent of usage of virtual classroom for teaching and learning hardware maintenance in Universities in Nigeria
- Determine the extent of usage of virtual classroom for teaching and learning software in Universities in Nigeria

Research questions: The following research questions were raised:

- What is the extent of usage of virtual classroom in teaching and learning of computer networking in universities in Enugu State of Nigeria?
- What is the extent of usage of virtual classroom in teaching and learning of computer hardware maintenance in universities in Enugu State of Nigeria?
- What is the extent of usage of virtual classroom in teaching and learning of computer software in universities in Enugu State of Nigeria?

Hypothesis:

- H_{01} : the use of virtual classroom does not significantly influence teaching and learning of computer education courses in public and private Universities in Enugu State, Nigeria

MATERIALS AND METHODS

The research design adopted for this study was descriptive survey. The study was carried out in Enugu state. The population for the study comprised of 354 respondents which include computer education students and lecturers from the three selected universities in Enugu state in Nigeria which are University of Nigeria Nsukka (UNN) and Enugu state university of Science and Technology (ESUT) and National Open University. The participants involved full time computer Education students and computer Education lecturers of the three universities.

Since, the population is manageable, total sampling technique was used for the study. A self-developed questionnaire titled "extent of usage of virtual classroom in teaching and learning computer courses in universities in Enugu State Nigeria" with 15 items to ascertain information from the students. The questionnaire was divided into two sections A and B. Section A was used to collect information on personal data of respondents while section B was designated with four likert scale responses of Very High Extent (VHE)-4, High Extent (HE)-3, Low Extent (LE)-2 and Very Low Extent (VLE)-1.

The research instrument was subjected to face validation by 3 experts from the Department of Computer Education, Faculty of Vocational and Technical Education, University of Nigeria, Nsukka. Cronbach alpha was used to determine the internal consistency of the instrument and reliability coefficient was 0.72 was obtained. The instrument was administered directly to the respondents by the researcher and was collected later by the researcher after the respondents have given their various responses to the instrument administered to them. The data collected from the study was analyzed using mean to answer the research questions and t-test statistic was used to analyze the null hypothesis at 0.05 statistical level of significance and relevant degree of freedom.

For the analysis of the data collected, any item that has a mean rating of 2.50 and above was considered high extent while any item below 2.50 was considered low extent. Hypothesis whose significance “sig. (2-tailed)” level is less than or equal to the stated 0.05 level of significance, the null hypothesis was rejected but if significance “sig (2-tailed)” level is >0.05 level of significance, the null hypothesis was accepted.

RESULTS AND DISCUSSION

Research question one:

- What is the extent of usage of virtual classroom for teaching and learning in networking in universities in Nigeria?
- H_{01} : there is no significant difference in the mean rating of the responses of Federal and Private Universities on Virtual classroom for teaching and learning of computer networking

Data in Table 1 shows that all the 5 items had their mean ranged from 3.21-3.76. This indicates that virtual classroom is utilized in very high extent for teaching and learning networking in universities in Nigeria. The standard deviation of all the 5 items ranged from 0.51-0.99 indicating that the respondents were not too far from mean and from one another in their responses. This

result shows that they have similar opinion on the extents of virtual classroom usage for teaching and learning networking in universities.

The table also indicates a significant difference on use of Virtual classroom teaching and learning of Networking in federal and private universities in Nigeria. The t-test value of 0.06-0.17 is >0.05 alpha level. The hypothesis is therefore, accepted, this means that use of virtual classroom significantly influence teaching and learning of Networking in federal and private universities in Nigeria.

Research question two:

- What is the extent of usage of virtual classroom for teaching and learning hardware maintenance in universities in Nigeria?

Data in Table 2 shows that all the 5 items had their mean ranged from 3.06 to 3.30. This indicates that the items are utilized in virtual classroom for teaching and learning hardware maintenance in universities in Nigeria. The standard deviation of all the 5 items ranged from 0.86 to 1.01 indicating that the respondents were not too far from mean and from one another in their responses. This result shows that they have similar opinion on the extents of virtual classroom usage for teaching and learning hardware maintenance in universities.

Research question three:

- What is the extent of usage of virtual classroom for teaching and learning Software in universities in Nigeria?

Data in Table 3 shows that all the 5 items had their mean ranged from 3.31-3.68. This indicates that the items are utilized in virtual classroom for teaching and learning Software in universities in Nigeria. The standard deviation of all the 5 items ranged from 0.67-0.89 indicating that the respondents were not too far from mean and from one another in their responses. This result shows that they have similar opinion on the extents of virtual classroom usage for teaching and learning software in universities.

Discussion of findings: The findings of the study in research questions which deals with usage of virtual

Table 1: Mean and t test response of respondents on the extent of usage of virtual classroom for teaching and learning computer networking in Universities in Enugu State, Nigeria

Items/statement	\bar{X}	SD	Sig.	Remark	Decision
1. Virtual learning environment are utilized in teaching and learning networking	3.43	0.99	0.06	NS	HE
2. Computer educators assess the student's performance on computer networking	3.76	0.57	0.65	NS	HE
3. Computer educator's uploads computer networking materials for students to learn	3.21	0.85	0.71	NS	HE
4. Computer educators monitors the students that participated in the virtual classroom when they are learning computer networking	3.11	0.79	0.08	NS	HE
5. Students connects to the school network when learning on virtual learning environment	3.58	0.62	0.15	NS	HE

SD; Standard Deviation, X: Mean; HE = High Extent; N = Number of respondents (40)

Table 2: Mean and t test response of respondents on the extent of usage of virtual classroom for teaching and learning computer hardware maintenance in Universities in Enugu State, Nigeria

Items/statement	X	SD	Decision
1. Students share hardware maintenance course material when learning in virtual classroom	3.26	0.96	HE
2. Computer educator's uploads hardware maintenance course material for students to learn	3.06	0.97	HE
3. Students are directed on how to resolve device technical faults in virtual classroom	3.11	1.01	HE
4. Computer educator made sure that the computers that student use for learning computer hardware maintenance is without faults	3.19	0.99	HE
5. Student's performance in computer hardware maintenance are assessed in the online class	3.31	0.89	HE

SD; Standard Deviation; X; Mean; HE= High Extent; N= Number of respondents (40)

Table 3: Mean and t test response of respondents on the extent of usage of virtual classroom for teaching and learning computer software in Universities in Enugu State, Nigeria

Items/statement	X	SD	Decision
1. Virtual learning environment are utilized in teaching and learning software	3.52	0.89	HE
2. Computer educators monitors the students that participate in the virtual classroom when they are learning computer software	3.66	0.67	HE
3. Students share software application among themselves in virtual classroom	3.41	0.75	HE
4. Computer educator's uploads computer software course material for students to learn	3.31	0.89	HE
5. Student's performance in computer software are assessed in the online class	3.68	0.72	HE

SD: Standard Deviation, X; Mean, HE = High Extent, N = Number of respondents (40)

classroom for teaching and learning of computer courses in Enugu State Universities. It was found that students use virtual classroom for teaching and learning of computer courses in Enugu State universities. Students make use of it in a very high extent. This finding was supported by Hall^[3] who opined that for the virtual classroom to be successful, facilities must be available. This implies that virtual classroom instruction is available in the Universities. However, it was further discovered that although virtual classroom instruction is available and used for teaching and learning of computer education courses, live audio-video support, whiteboard, multi-level feedback mechanism, live tech support, synchronous learning was not often used in instruction. This study is in line with the work by Mallareddy^[9] whose study revealed that there was inadequate interaction with the facilities and the learners. The study also revealed that virtual classroom provides flexible environment for effective interaction, support self-discovery of learning content, provides time management facilities for organized activities, provides essential materials in visible format and provides human interaction. This is also supported by Gedera who asserted that most of the students preferred to have virtual classroom activities because of the presence of cues and human interaction. The study also showed a significant influence of use of virtual classroom on teaching and learning networking, software and hardware maintenance. The reason for this result is that virtual classroom promotes flexible learning and access to instructional facilities and information. It promotes independent and autonomous learning as well as discovery of knowledge and skills. This is supported by the submission by Perumalla *et al.*^[7] who opined that use of virtual classroom ensures effectiveness of instruction that enhance student's performance. The study is also supported by the work by Gedera and Mallareddy^[9] who

showed that use of virtual classroom developed better understanding of student's experiences during learning and also it removes barriers of time and space, overcome the unavailability of teachers, sessions and can be quick to organize. The implication of this study is that use of virtual classroom if extended to virtual education programs in Nigeria can enhance quick access to instruction, knowledge and skills developments, development of competencies and academic performance of students, especially in computer education courses.

CONCLUSION

This study is on the use of virtual classroom for teaching and learning of computer courses in Enugu State Universities. This study concludes that virtual classroom is in use and it promotes instructional strategies like collaboration, independent, autonomous, synchronous and asynchronous instructional strategies that expose computer education students to access information, knowledge and skills. These attributes are important predictors of teaching and learning.

RECOMMENDATIONS

The following recommendations are rendered to facilitate effective use of virtual classroom in teaching and learning. Universities should encourage their staffs to use virtual classroom for teaching and learning of all the courses they teach the students. Newly employed Computer Educators should be trained on the development and use of virtual classrooms by the institutions. New Computer Education students should be trained on the use of virtual classroom for easy access to education and learning capabilities.

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