Virtual Classroom And Academic Performance of SS II Physics Students in Secondary Schools in Abak Local Government Area , Akwa Ibom State

Etukakpan Uduak Abel
Department of Education Technology &
Library Science
University of Uyo, Uyo.

Maduka Confidence Otabuko
Department of Curriculum &
Teacher Education, Abia State
Universit,. Uturu.
&
Christopher Asukwo Uneh
Public Health, Department of Physical & Health Education,
Faculty of Education, University of Uyo, Uyo.

Abstract
This paper examined the use of virtual classroom and academic performance of SS II physics students in secondary school in Abak LGA of Akwa Ibom state. An intact class sample size of 60 students were drawn from a population of 600 SS II students, comprises 30 male and 30 female, simple random select from their test scripts. Two research questions and two hypotheses were formulated for the study. Mean and variance were used to answer the two research questions while independent t-test was used to answer the two hypotheses at 0.05 significant level. The findings shows that physics students exposed to virtual classroom performed better than those in conventional class, though not significant and male physics students exposed to virtual classroom also performed a little better than their female counterpart. It was recommended that teachers, school administrators, students, parents, government agencies and curriculum developers should take advantage of the available technology to improve teaching-learning process, because virtual classroom brings instructional materials to classroom which ordinarily will not be possible to access, it removes distance barrier in acquisition of education, it makes learning ubiquitous, facilitates distance learning.

Keywords: Academic Performance, Classroom, Physics, Virtual

Background of the Study
    Society is undergoing transformation evoke by the rapid development and diffusion of information and communication technology (ICT) in all works of life. This development has also made a considerable impact in the teaching and learning process. As a result, many innovative teaching strategies can be used to make teaching-learning process more fascinating (Etim,2016).
    The challenges in educational sector in Nigeria have always been accessibility of quality learning environment with well-equipped laboratories and modern facilities that can enhance teaching- learning process. Education is about teaching - learning and the aim is to ensure

effective classroom communication which involves proper identification, assembly and application of technological principles to facilitate change in behaviour and performance, which prompted the adoption and adaption of technology in educational system, hence the introduction of virtual classroom.

Virtual classroom has no single definition because the system is characterized as the learning devoid of time and space. Learning is continuously adopting new formats involving advanced technologies such as multimedia, internet, blogs, website, mobile phone and wikis as these are accessed in the internet. Virtual learning is not a factor that is confined in the walls of a traditional classroom. According to Lokie (2011), virtual learning expands the possibility of using internet facilities, platforms, satellite links, and related system to access, analyse, create, exchange, and use data, information, and knowledge in ways which until recently, were almost unimaginable. In effect, it involves learning acquired by students through the interaction of digitally delivered content. Classrooms are no longer restrained to schools; classrooms are anywhere there is an internet connection. Students with disabilities that cause them to miss school don't need to fall behind on their schoolwork. Whether it's as simple as using Skype to call into their class or using dedicated software created for distance learning, students learning from home or a hospital can stay on track

A virtual classroom according to (Rachang,2018) is an online learning environment that allows for live interaction between the tutors and the learners as they are participating in learning activities. Some of the merits accruable from the virtual classroom are as follows; It provides the learners the flexibility of getting the learning experiences at the time, place and rate of assimilation. Virtual classroom can help in good class organization. The operational documents, assignments, class notes and other related information in the internet can be readily categorized for easy accessibility for the teachers and students. The information posted on the internet could be easily revised and updated for more effective teaching and learning.

Virtual classroom provides the learners with the opportunity of gaining learning experiences 24 hours of every 7 days a week without tampering with the learner's leisure time. The system has the capability of employing the services of most experienced personnel in different areas of need which is not possible in traditional classroom setting. Another educational value is the intellectual and social partnership created by the technology of virtual classroom. Students in their use of technological equipment cultivate the habit of leadership role in relation to other students. The implication is that the technology used increases group cohesion and mutual support more especially in remote classrooms. Besides the virtual classroom enables the students to develop a range of communicative skills that enable them perform creditably in class. Virtual classroom saves money, time and transport for students. The students who are motivated could work on their own at their home environment without wasting time and money to travel to school. The teacher equally enjoys the teaching because everything is digital and these works in general are sent through e-mail typed. The teacher can easily re-use his materials and can easily get materials elsewhere. The system can prove quite advantageous to the students in various ways with regard to its on-line features. It will help in admission, information about the courses and academic activities, assignments and projects, tests and evaluation, grading and results, faculty available for interaction, guidance and needed help,

information about the commencement of the public examinations, merit schemes, entry in a vocational and professional stream etc.

Accordingly (Udoh, 2016) 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.

Anekwe and Uzoamaka (2017) adopted a descriptive approach to examine the impacts of virtual classrooms on students' learning. Virtual classrooms are technologically-driven classrooms that support self-directed and self-regulated learning. The study was carried out in two federal and two state universities in the South-East zone of Nigeria. Four research questions and four hypotheses guided the study. The sample comprised of 280 federal university students and 226 state university students given a total sample of 506 respondents. Stratified random sampling due to ownership (federal and state) was used. Other sample techniques used were; those students who have been involved in online programmes recently and those currently in the programme. Students' consent was also sought before the selection. The instrument was validated. Internal consistency was computed using Cronbach alpha for the four sections, thus; Section A = 0.80; Section B = 0.83; Section C = 0.79; and Section D = 0.85. The instrument was administered and data collected. The data collected were analysed using means for research questions and independent sample t-test to test the hypotheses at 0.05 level of significance. The results showed among others that virtual classrooms have positive impacts on the students of federal and state universities, they reported positively on their continued support and preparedness for virtual classrooms. Based on the findings, the recommendation were that many more students should be made to be more aware of the impacts of the virtual classrooms. They should also be motivated to be participating more in virtual classrooms. Academic performance in the other hand is the extent to which a student, teacher or institution has attained their short or long-term educational goals . Completion of educational benchmarks such as secondary school diplomas and bachelor's degrees represent academic achievement.

Academic performance is commonly measured through examinations or continuous assessments but there is no general agreement on how it is best evaluated or which aspects are most important; procedural knowledge such as skills or declarative knowledge such as facts . Furthermore, there are inconclusive results over which individual factors successfully predict academic performance, elements such as test anxiety, environment, motivation, and emotions require consideration when developing models of school achievement

Some of the factors that influenced academic achievement are; Individual differences influencing academic performance, this have been linked to differences in intelligence and personality (Stumm, 2011). Students with higher mental ability as demonstrated by IQ tests and those who are higher in conscientiousness (linked to effort and achievement motivation) tend to achieve highly in academic settings. A recent meta-analysis suggested that mental curiosity (as measured by typical intellectual engagement) has an important influence on academic achievement in addition to intelligence and conscientiousness (Stumm, 2011).

Bossaert (2011) opined that Children's semi-structured home learning environment transitions into a more structured learning environment when children start first grade. Early academic achievement enhances later academic achievement. This study adopted Bruner's constructivism learning theory which is a philosophy that enhances students' logical and conceptual growth. The underlying concept within the constructivism learning theory is the role which experiences-or connections with the adjoining atmosphere-play in student education.

The constructivism learning theory was adopted for the study, the theory argues that people produce knowledge and form meaning based upon their experiences. Two of the key concepts within the constructivism learning theory which create the construction of an individual's new knowledge are accommodation and assimilation. Assimilating causes an individual to incorporate new experiences into the old experiences. This causes the individual to develop new outlooks, rethink what were once misunderstandings, and evaluate what is important, ultimately altering their perceptions. Accommodation, on the other hand, is reframing the world and new experiences into the mental capacity already present. Individuals conceive a particular fashion in which the world operates. When things do not operate within that context, they must accommodate and reframing the expectations with the outcomes.

The role of teachers is very important within the constructivism learning theory. Instead of giving a lecture the teachers in this theory function as facilitators whose role is to aid the student when it comes to their own understanding. This takes away focus from the teacher and lecture and puts it upon the student and their learning. The resources and lesson plans that must be initiated for this learning theory take a very different approach toward traditional learning as well. Instead of telling, the teacher must begin asking. Instead of answering questions that only align with their curriculum, the facilitator in this case must make it so that the student comes to the conclusions on their own instead of being told. Also, teachers are continually in conversation with the students, creating the learning experience that is open to new directions depending upon the needs of the student as the learning progresses. Teachers following Piaget's theory of constructivism must challenge the student by making them effective critical thinkers and not being merely a "teacher" but also a mentor, a consultant, and a coach.

Instead of having the students relying on someone else's information and accepting it as truth, the constructivism learning theory supports that students should be exposed to data, primary sources, and the ability to interact with other students so that they can learn from the incorporation of their experiences. The classroom experience should be an invitation for a

myriad of different backgrounds and the learning experience which allows the different backgrounds to come together and observe and analyze information and ideas.

Statement of the Problem

The challenges in educational sector in Nigeria have always been accessibility of quality learning environment with well-equipped laboratories and modern facilities that can enhance teaching- learning process. Physics is a branch of science that deals the behaviour of matter. It is a requirement for science related programmes in tertiary institutions, it is important for all science students in secondary school. High performance in physics can be achieved with the adoption of virtual classroom, this will minimize the problems like lack of qualified faculties, distance barrier to access the few equipped schools available, hence this study investigates the effects of virtual classroom on student's academic performance in secondary school.

This study aimed to; determine the difference in academic performance of physics students exposed to virtual classroom and those in conventional classroom, find out the effects of virtual classroom on gender. The findings of this study would be beneficial to stakeholders in educational sector, it would help the curriculum planners/designers, it would benefit government, teachers, students and parents.

Research Questions

1. What is the difference in academic performance of physics students exposed to virtual classroom and those in conventional classroom?
2. How does virtual classroom influence the academic performance of male and female physics students?

Null Hypotheses.

Null hypothesis 1: Academic performance of physics students exposed to virtual classroom and those using conventional classroom do not differ significantly.

Null Hypothesis 2. Academic performance of male and female physics students exposed to virtual classroom do not differ significantly.

Methodology

The study adopted quasi experimental research design. The design was necessary because it enhances intact class selection of participants for experimental and control groups. This study was conducted at Abak LGA of Akwa Ibom State. The population of SS2 physics students in the 11 public schools in Abak was 600. A sample size of 60 students was used which comprises of 30 male and 30 female, intact class was used for the selection. A physics test instrument (PTI) was used for data collection. The (PTI) contained 20 multi-choice items.

The instrument was face and content validated by physics teacher and two expert in Department of Measurement and Evaluation, test and measurement Unit. Their input was in-cooperated into the final copy of the instrument. To determine the reliability of the instrument, the instrument was administered to 20 students who were not part of the process, and a split- half method was used to establish the reliability of the instrument. The data collected was analysed

using Pearson products moment correlation and it yielded a coefficient of 0.7. The r-value was subjected to spearman-Brown test which yielded a coefficient of 0.81, signifying high reliability.

The PTI was administered to the respondent in the two groups (experimental and control) through research assistants in their various schools. ean and variance was used to answer the two research questions while independent two tailed t-test was used to answer the hypotheses at 0.05 significant level.

Research Question 1: What is the difference in academic performance of physics students exposed to virtual classroom and those in conventional classroom?

Null hypotheis1: Academic performance of physics students exposed to virtual classroom and those using conventional classroom do not differ significantly.

Table 1

t-Test: Two-Sample Assuming Unequal Variances

	control	Experiment	
Mean	53.1	54.2	
Variance	106.231	118.5103	
Observations	30	30	
Hypothesized Mean Difference	0		
Df	58		
t Stat	-0.40		
P(T<=t) one-tail	0.34462		
t Critical one-tail			1.67
P(T<=t) two-tail			0.68
t Critical two-tail			2.00

From Table 1, the mean of control group is 53.1 and that of experimental group is 54.2, the difference in mean is 1.1 signifying that treatment group performed better than the control group, though not significant. Also From Table 1, the t-crit value is 2.00 and the t-cal value is 0.40 which is less than the critical value, hence the null hypothesis is upheld.

Research Question 2: How does virtual classroom influence the academic performance of male and female physics students?

Null Hypothesis 2. Academic performance of male and female physics students exposed to virtual classroom do not differ significantly

Table 2

t-Test: Two-Sample Assuming Unequal Variances

	male	Female
Mean	55.4	53
Variance	84.25714	158.1429
Observations	15	15
Hypothesized Mean Difference	0	
Df	26	
t Stat	0.59	
P(T<=t) one-tail	0.277828	
t Critical one-tail	1.705618	
P(T<=t) two-tail	0.55	
t Critical two-tail	2.05	

From Table 2, the mean of of male is 55.4 and that of female is 53, the difference in mean is 2.4 signifying that male students exposed to virtual classroom performed better than their female counterpart, though not significant. Also. Table 2 shows t-crit to be 2.05 and t-cal to be 0.59 which is less than t-crit value, therefore the null hypothesis is upheld.

Discussion of the Findings

The result from research question one on table 1 shows that physics students exposed to virtual classroom performed better than those in conventional classroom.
The result from Hypothesis 1 shows that there is no significant difference in academic performance between students taught in a virtual classroom and those taught in conventional classroom. The result from research question two on table 2 shows that male physics students exposed to virtual classroom performed better than female physics students exposed to virtual classroom. The result from hypothesis 2, shows that there is no significant difference in academic performance between male physics students taught in a virtual classroom and female physics students taught in virtual classroom. This is in agreement with (Udoh, 2016), that investigated the use of virtual classroom instruction on students' academic performance in Educational Technology in the University of Calabar. The result of the analysis indicated that utilization of virtual classroom instruction influenced students' academic performance in Educational Technology.

Recommendations

1. Teachers, school administrators, students, parent, government agencies and curriculum developers are advice to take advantage of the available technology to improving teaching-learning process.

2. Virtual classroom brings instructional materials to classroom which ordinarily will not be possible to have the, e.g ship in a remote area. It removes distance barrier in acquisition of education, it makes learning ubiquitous. Virtual classroom facilitates distance learning.

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