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Effects Of E-Learning On Secondary School Students' Academic Performance In Computer Studies In Ekiti State

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Abstract
The study investigated the effects of e-learning on secondary school students' academic performance in Computer Studies. The population for the study comprised 19,603 Senior Secondary School Two (SSS II) students in Ekiti State. A total of 109 Senior Secondary School Two (SSS II) students were selected using multistage sampling procedure. The study adopted quasi-experimental pre-test post-test control group design. The study made use of one instrument which was the Computer Performance Test (CPT) designed by the researcher. Face and content validity were ascertained for the instrument. The reliability coefficient of 0.70 was obtained using Pearson's Product Moment Correlation analysis. Mean and standard deviation were used to answer the research question while the hypotheses were tested using t-test at 0.05 level of significance. Results of the study showed that there was significant difference between the post-test mean scores of students exposed to e-learning and conventional method. Based on the findings of this study, it was recommended that the use of e-learning should be encouraged for teaching Computer Studies in secondary schools to enhance the academic performance of the students.

Keywords: *E-learning, academic performance, conventional, computer*

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I. Introduction

Teaching and learning is an essential process of development for man. Its effect is seen in the society when both teachers and students actively participate in the process. Well-planned and properly directed educational programme is a key to success and progress of a nation. No nation can boast of being rich in knowledge and skill without integrating technology into their educational system (Obiageli, 2015). Learning is an activity that starts at birth and can be expected to continue for a lifetime. In the classroom, effective learning is expected to take place in a well-organized way**.** Students are required to make use of available facilities for practical oriented subjects in order to make the learning meaningful and impactful. It was observed by the researcher as a teacher that in most schools, teaching and learning facilities seem not to be sufficient to complement the efforts of the teachers. Some that are available are kept inside stores to avoid been stolen.

There are several subjects learnt in schools which include Computer Studies. Computer Studies is taught both in junior and senior secondary school levels. Computer Studies is required to keep the students abreast of the growing trend in technology. The introduction of Computer Studies is aimed at teaching the learners all about the concepts of computer and its applications. Its knowledge can lead to the acquisition of practical and applied skills. Ajayi (2013) defines Computer Studies as a subject which involves teaching and inculcating in the learner the basic skills required to manipulate the computer to achieve some educational goals. Such basic skills and competencies, upon completion of their secondary education, make them conversant with terms and practices embedded in the world of computer. Computer Studies is introduced at all levels of education to help people appreciate the functions, uses and limitations of the computer. It also provides opportunities for the study of the modern methods of information processing. It could also be regarded as the study of the theory, design, use and analysis of computer devices which entails knowing the computer itself, its operation, what it can do, how it can do it and why it is doing it. These form the basis of Computer Studies curriculum in secondary schools.

According to Abdulahi (2007), most teachers emphasize on theory rather than practical aspects of science subjects. He added that the teaching of science including Computer Studies has been reduced to a descriptive exercise through the use of conventional method of teaching. Understanding the practical aspects of Computer Studies would not only help students to explore creativity and imagination but would also help to understand technologies.

Nigerian Educational Research and Development Council (NERDC, 2009) states the general objectives of teaching Computer Studies in secondary schools which include: exposing students to the basic rudiments of computer and its workings; laying solid foundation in Computer Science at early stage of educational exposure; encouraging and stimulating the interest of the students toward Computer Science; to pave way for easy application of computer knowledge in other disciplines; to ensure literacy in Computer Science at secondary school level; and to meet the demand of our time to keep up with changing strides in technological development. The West African Senior Secondary Certificate Examination (WASSCE, 2019) syllabus states the objectives of teaching Computer Studies as a subject in senior secondary school as to test candidates': understanding, knowledge and acquisition of basic concepts of computer and its operations; manipulative, computational and problem-solving skills; application of software packages; operation of computer-related simple devices; online skills and their applications; safe attitudes and good practices on effective use of computer; and potential for higher studies in Computer related areas.

In most of the schools in Ekiti State, it was observed by the researcher that learning of Computer is still characterized by teacher-centered approach which might make learning ineffective and deny learners the chance to apply the skills learned in the actual situations. Adeniyi and Yusuf (2016) state that the pattern of teaching and learning process is expected to shift from the conventional method to a more dynamic and flexible one, which is learner-centered. This learner-centered approach makes students to influence the content, activities, materials and pace of learning, which places them in the centre of the learning process and enhances independent learning.

The need to use activity-oriented and learner-centered strategies of teaching in secondary schools is emphasized in the Nigerian National Policy on Education (2014) which states that educational activities shall be centered on the learners for maximum self-development and fulfilment and also that educational system should be structured to develop the practice of self-discovery. Teaching the adolescent involves using varieties of methods that could actively engage them. Since they are still very exuberant and energetic they need to be very involved in the teaching and learning process through answering questions, carrying out assignments, and projects, playing roles and simulating situations.

Most of the students at the secondary school level are adolescents and they possess adolescent features that could hinder the teacher's job if not properly cared for. The use of conventional method for teaching every concept embedded in Computer Studies curriculum might not actively engage the learners and this might have effects on their performance in Computer Studies. There is a need to introduce a teaching strategy in which learning would be consistent, standardised, and students might be allowed to complete their works at their own pace and repeat the lessons as much as they need. They might also study in ways that fit their learning styles until they have reached the level of subject mastery. This might be achieved if e-learning is introduced.

E-learning deals with the use of all types of technologies, including electronic technologies in learning and practice. This means, using a computer to deliver part, or all of a course whether it is in school, part of business training or a full distance learning course. It entails the use of electronic educational technology. E-learning could be considered as a substitute to all necessary and needed facilities for effective teaching - learning process (Obiageli, 2015). E-learning could offer numerous benefits to enhance schools' professional development and improve their organisational performance and productivity, and students could engage in learning whether they are in school or at home.

The introduction of e-learning in teaching and learning processes have been seen as a means to improve accessibility, efficiency and quality of learning by facilitating access to information resources and services as well as remote exchanges and collaborations among the students and teachers in secondary schools (Olojo, Adewumi, & Ajisola, 2012). Thus, e-learning is regarded as a typical shift in educational sector for the purpose of advancing the knowledge base. Omotayo, Ajayi, and Ayodele (2013) asserted that e-learning holds a great deal of potentials for increasing students' educational opportunities. The concept of e-learning is considered to be very attractive as a new learning model whose effect might be a positive one to the development of education in developing countries like Nigeria, with all its potentialities. Although, not much effort is taken for its implementation, existing research of e-learning in Nigeria shows that having e-learning on the educational agenda in Nigeria still faces a lot of challenges (Nwanze, 2014). E-learning is a learner-centered instructional strategy which gives students the opportunity for an in-depth investigation of a given topic. With the advent of information and communication technology and its growing use in education sector, innovation is expected to be seen in teaching methods that are used in schools especially in teaching Computer Studies.

Performance of students in Computer Studies needs to be given attention. Students without hundred percent performance might not be best products of the programme because computer application practices require high proficiency in the subject. Ekiti State Analysis of West Africa Secondary Schools Certificate Examination (WASSCE) results for the year 2014 to 2018 showed that the percentage of students between grades A1 and B3 in Computer Studies is still far below expectation.

Purpose of the Study

The purpose of the study was to:

i. examine the effects of e-learning on secondary school students' academic performance in Computer Studies in Ekiti State;
ii. examine the influence of sex on secondary school students' academic performance in Computer Studies in Ekiti State;
iii. examine the influence of school type on secondary school students' academic performance in Computer Studies in Ekiti State.

Research Question

In this study, one research question was raised to guide the work:

1. Will there be any difference in the performance of students exposed to e-learning and those exposed to conventional method in Computer Studies?

Research Hypotheses

1. There is no significant difference between the pre-test mean scores of experimental and control groups in Computer Studies.
2. There is no significant difference between the post-test mean scores of experimental and control groups in Computer Studies.
3. There is no significant difference in the mean scores of male and female students exposed to e-learning in Computer Studies.
4. There is no significant difference in the post-test mean scores of students in public and private schools in experimental group.

II. Methods

Research Design: The study adopted quasi-experimental pre-test post-test control group design. The study made use of two groups; one experimental and one control groups. The experimental group was exposed to the use of e-learning for teaching Computer Studies while the control group was taught using conventional method.

The experimental design is as shown below:

Experimental Group: O_1 X O_2
Control Group: O_3 C O_4
where:

O_1, O_3	Observations before treatment
O_2, O_4	Observations after treatment
X	Treatment for Experimental Group
C	Treatment for Control Group

Population

The population for the study comprised 19,603 Senior Secondary School Two (SSS II) students in Ekiti State. (Source: Ekiti State Teaching Service Commission, Ado Ekiti, 2018). It comprised all male and female students in public and private secondary schools in Ekiti State.

Sample and Sampling Techniques

The sample for the study consisted of 109 Senior Secondary School Two (SSS II) students offering Computer Studies in Ekiti State. Multistage sampling procedure was used to select the sample. The first stage involved the selection of two Senatorial Districts among the three Senatorial Districts in Ekiti State using simple random sampling technique by balloting. The second stage involved the selection of one Local Government Area from each of the Senatorial Districts selected using simple random sampling technique. The third stage involved the use of stratified sampling technique to select two schools (one private and one public schools) from each Local Government Area putting into consideration sex and school type. Intact class was used in each of the schools selected.

Research Instrument

The study made use of one instrument which is the Computer Performance Test (CPT) designed by the researcher. The instrument was divided into two sections. Section A of the instrument was designed to obtain demographic data of the respondents which consist of name of school, school type, and sex. Section B consisted of 25 multiple choice questions with four options (a – d) based on the selected topics used during the experiment for the study. The instrument was used as pre-test and re-arranged for post-test.

Experimental Procedure

The experiment was carried out in three stages, which are:

i. Pre-treatment stage
ii. Treatment stage
iii. Post-treatment stage

Pre-Treatment Stage: At the pre-treatment stage, the researcher visited the schools selected to obtain permission from the school administrators. The researcher also requested for the Computer Studies teachers who served as the research assistants in the selected schools and enlightened them about the purpose of the research. Training of the teachers used for the research also commenced immediately. The training was meant to discuss the method to be used for teaching Computer Studies i.e. e-learning for the experimental group, and conventional method for the control group during the duration of the treatment. This was done within one week for the Computer Studies teachers in each of the schools selected. Pre-test was administered during the same week to the students in each of the schools before the treatment. The test was marked and recorded.

Treatment Stage: At the treatment stage, students in the control group was exposed to the use of conventional method for teaching Computer Studies while the experimental group was exposed to e-learning through the Internet. Treatment was given to the control and experimental groups for four weeks.

Post-Treatment Stage: At the post-treatment stage, Computer Performance Test (CPT) was re-arranged and re-administered on the experimental and control groups. Their responses were collected, marked and recorded. The scores were arranged according to sex (male and female), and school type (public and private). The recorded scores were collated for data analysis.

Data Analysis

Descriptive statistics of mean and standard deviation were used to answer the research question for the study. Hypotheses were tested using t-test statistics at 0.05 level of significance.

III. Results

Hypothesis 1: There is no significant difference between the pretest mean scores of experimental and control groups in Computer Studies.

Table 1: t-test Analysis for Pretest Mean Scores of Students in Experimental and Control Groups

Variations	N	Mean (X)	SD	df	t	p	Remark
Experimental	66	14.64	2.51	107	0.37	0.72	Not Significant
Control	43	14.47	2.19				

$p > 0.05$

Table 1 shows that the t-cal value is 0.37 and the p value is 0.72. This shows that p value is greater than 0.05 level of significance, hence the null hypothesis was not rejected. This implies that there is no significant difference in the pretest mean scores of students exposed to e-learning and conventional method. This shows that the two groups were homogeneous at the commencement of this study.

Hypothesis 2: There is no significant difference between the post-test mean scores of experimental and control groups in Computer Studies.

Table 2: t-test Analysis for Post-test Mean Scores of Students in Experimental and Control Groups

Variations	N	Mean $(\bar{X})$	SD	df	t	p	Remark
Experimental	66	18.98	2.68	107	5.32	0.00*	Significant
Control	43	16.19	2.69				

$*p < 0.05$

Table 2 shows that the t value is 5.32 and the p value is 0.00. It shows that p value is less than 0.05 level of significance. The null hypothesis was therefore rejected. This means that there is significant difference in the post-test mean scores of experimental and control groups. The mean score shows a large difference in favour of e-learning, an indication that e-learning enhanced better performance of the students in Computer Studies.

Hypothesis 3: There is no significant difference in the mean scores of male and female students exposed to e-learning in Computer Studies.

Table 3: t-test analysis for mean scores of male and female students in experimental group

Variations	N	Mean ($\bar{X}$)	SD	df	t	p	Remark
Male	33	19.36	2.71	64	1.15	0.25	Not significant
Female	33	18.61	2.65				

$p > 0.05$

Table 3 shows that the t value is 1.15 is and the p value is 0.25. This shows that p value is greater than 0.05 level of significance. This implies that the null hypothesis was not rejected. Hence, there is no significant difference in the mean score of male and female students exposed to e-learning. Both male and female performed equally.

Hypothesis 4: There is no significant difference in the post-test mean scores of students in public and private schools in experimental group.

Table 4: t-test of post-test mean scores of students in private and public schools in experimental group

Variations	N	Mean ($\bar{X}$)	SD	df	t	p	Remark
Public	30	18.50	2.06	64	1.63	0.11	Not significant
Private	36	19.57	3.22				

$P > 0.05$

Table 4 shows the t value of 1.63 and the p value is 0.11. This shows that p value is greater than 0.05 level of significance. This implies that the null hypothesis was not rejected. Hence, there is no significant difference between the post-test mean scores of students in private and public schools in experimental group.

IV. Discussion

This study shows that e-learning and conventional method influenced students' performance in Computer Studies with e-learning having higher effect. It shows that e-learning has effect on students' performance in Computer Studies. This may be attributed to the fact that students tend to readily welcome the idea of being taught with information and communication technology gadgets. This finding agrees with the submission of Keziah (2011) who found that the use of computer in teaching improved students' academic performance, and Fayomi, Ayo, Ajayi and Okorie (2015) who found that e-learning facilitated studies significantly improved students' academic performance, learning process and self-development.

Furthermore, the study showed that there was significant difference in the pre-test and post-test scores of students in Computer Studies between the groups especially e-learning. It is obvious from the findings that e-learning is fundamental to good performance in Computer Studies. This is because e-learning enables students to develop their proficiency in the use of the computer system and the internet without rigid restrictions to instructions. This finding contradicts the report of Odhiambo (2013) who found that e-learning has no positive impact on students' academic performance.

The study also showed that there was no significant difference in academic performance of male and female students exposed to e-learning. This implies that sex has no effect on the use of e-learning. to impact students' academic performance in Computer Studies. The slight mean difference observed was not significant. This finding agrees with the submission of Adigun, Onihunwa, Irunokhai, Sada and Adesina (2015) who found that male students had slightly better performance compared to female students though it was not significant. This indicates that male and female students will achieve equally with the use of any good instructional strategy. On the contrary, the finding disagrees with that of Odhiambo (2013) who found that, after controlling for other factors, female students benefited less from e-learning than their male counterparts.

The study also showed that there was no significant difference in academic performance of students in private and public schools exposed to e-learning. This means that school type has no effect on the performance of students. This supports the findings of Alimi, Ehinola and Alabi (2012) and Musibau and Johnson (2017) who found that there is no significant difference in the performance of students based on school type. This finding contradicts the submission of Mburu (2013) who found that the type of school attended affected students' academic performance. This may be because in recent times both private and public schools' administrators are aware of the importance of ICT facilities in education, and they are putting in their best to ensure that these facilities are available to enhance students' performance in Computer Studies.

V. Conclusion

The study showed that conventional method even has impact on students' academic performance in Computer Studies but e-learning is more effective than conventional method in enhancing students' performance in Computer Studies. It was established that e-learning could enhance students' performance in Computer Studies in secondary schools. The study also established the effectiveness of e-learning in teaching

Computer Studies. It was also found that sex and school type have no significant influence on students' academic performance when e-learning was used for teaching Computer Studies.

VI. Recommendations

Based on the findings of this study, it was recommended that the use of e-learning should be encouraged for teaching Computer Studies in secondary schools to enhance the academic performance of the students.

It was also recommended that male and female students should be encouraged in the use of e-learning and there should not be any form of discrimination in Computer Studies class.

Also Computer laboratories in both private and public secondary schools should be fully equipped with facilities needed for implementation of e-learning for the teaching of Computer Studies in secondary schools across the state.

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