EFFECT OF E-LEARNING ON THE ACADEMIC ACHIEVEMENT OF BASIC SCIENCE STUDENTS IN SECONDARY SCHOOLS

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ABSTRACT

The study investigated the effect of electronic learning on the academic achievement of Basic science students in SECONDARY SCHOOLS, in general. A pretest, posttest, control group, Quasi experimental design was adopted. One hundred and four (104) senior government school students were selected for the study to further the research analysis. The school were randomly selected and assigned to be the experiment and control groups. The study lasted for five weeks, three instruments IGELS, IGMLM and BSAT were used for the study. One research questions was posed and answered using mean and standard deviations and one null hypothesis was tested at 0.05 level of significance using analysis of covariance (ANCOVA).The findings revealed that those taught with E-learning had higher mean 72.33, then those taught with modified lecture method 50.59 with a mean difference 21.74. E-learning had significant effect on students academic achievement in BSIC SCIENCES, (fi 101=76.392,p<o.o5,partial eta squared=0.558) with an effect of 55.8

Finding showed that there was a significant difference in students' achievement in basic science students with E-learning modified lecture method, the E-learning students perform better. It was recommended that government should provide E-learning for materials for school and have to give frequent training to teachers to acquire the basic skills.

Key Words: Electronic learning, IGELS, IGM LM and BSAT.

INTRODUCTION

It has become so glaring to everyone that the world has become a global village, people are becoming more and more familiar to use of smart phone, computer and other technological devices used in accessing the internet on a daily basis. The introduction of multimedia technologies and internet in learning has been observed as a vital mean of improving accessibility and quality of delivery of learning among students and teachers in secondary school (fayomi, ayo & okorie ,2015) Electronic learning which is also referred to as e-learning is seen as a good tool that can be used to enhance learning process. E-learning makes use of computer, lap-tops, mobile phones which most secondary school students have to access to. These components are either owned by the students or by their parents, therefore could watch a video on what was taught in a classroom and at home could make abstract concept to become very real to the students .(Arbon 2011).

Science helps students to gain an understanding of role and function of science in everyday life and the world in which they live. It can be further argued that integrating principles as found in secondary school sciences are intended to produce a course which is relevant to students' needs and experience. Nevertheless, laying adequate foundation for subsequent specialist course of study and also adds a cultural dimension to science education.

Through the process of integration of science, one can realize the following:

1) There is an interested scientific literacy
2) The students are exposed to the process of science
3) The students have increased interest in science
4) The students secondary science as one with no clear boundaries of individual subject s
5) The relationship of science to society is clearly seen
6) The students imbibe the scientific attitude s
7) The students use laws, theories, facts, principles, and generalization in science to solve daily problems.

Research findings have shown that the performance of students in science subjects have not been encouraged (Akapan,2012 & Moses,2013). Factors responsible for this poor performance have been attributed to inadequate textbooks, unqualified science teachers, lack of learners' interest, lack of well equipped laboratories, psychological fear of science subject and also teaching methods and not proper strategies (Akpan 2008 &Moses 2012)

Okebukola (1997) indicated that in most of the schools the science teaching is mostly done in lecture method. It was found that, the approach is not good enough for science teaching .Even when science curriculum recommended the guided 'Discovery Method' for teaching most of the science topics, yet common conventions use probably lecture methods in science teaching and learning largely due to lack of instructional materials mostly in schools of the rural areas. It is understood that schools in such areas lack adequate laboratories which is sure to affect the effective teaching and learning process of science subjects.

Ayooluwa, 2015, in a research findings discovered a positive outcome, that E-learning further develops students computer skills, encourage students approach of learning and help the students to study science content rather n easy access. None the less it is stressed that E-learning makes students have infinite access to unlimited information of varying degrees. It is well-accepted that E-learning allows students to use various kinds of technology to conduct research, communicate and create knowledge. Similarly, some scholars in their findings observed that E- learning has significant impact on students. Olebhiele 2015 discovered that E-learning has significant effect on students' mean achievement score than with those taught with lecturer method. Another research writer, Owino 2013 found out that students taught with the E-learning performed lower than those taught with conventional study mode. The cause of such reasoning would have been due to unfocussed approach to learning.

STATEMENT OF THE PROBLEM

The discouraging performance of Science students in secondary schools in general is taken to study in this research paper. One of the main factors that attributed to these situational stances is the use of conventional teaching methods like the lecture method which has been in practice over decades. These methods have led to rote learning of science, hence affecting the effective delivery of science. Modern innovative strategies are therefore being sorted by the researcher, with the advent of ICT; the E-learning strategy could be used to see if there could be an improvement in the performance of Science students in secondary school. Hence this study has an upcoming effect of E-learning on academic achievement of science students.

PURPOSE OF THE STUDY

The purpose of this study is to investigate the effect of electronic learning achievement of science students in government secondary school in

Specifically the study is to find out the difference that exists in students' achievement in sciences when taught with E-learning and modified lecture method to make learning inspiring.

Research questions:

Only one research questions was raised for this observational study:

I) What difference exists in students' achievement in science when taught with E-learning and modified lecture method?

RESEARCH HYPOTHESIS

A hypothesis was tested for significance at alpha level < 0.05.

There is no statistically significant differences in students' achievements in science when taught with E-learning and modified lecture method.

METHOD

The study adopted the pretest, posttest, control group, quasi experimental design. A 2×2 factorial matrix was adopted with instructional strategies, E-learning and modified lecture method as relevance to study.

The study was done in two government secondary school in Tamil Nadu, Southern part of India. The two schools were selected and assigned to treatment and control groups based on following criteria:

1) The school must be a public school

2) The school must have qualified science teachers

Intact classes were used: The experimental group was taught using E-learning, while the control group was taught using modified lecture method, one of the school was randomly selected as experimental group and the other as control. A total of number of 104 students 51 male and 53 female students were taken as sample for study.

Three instruments were used for this study:

1) Instructional Guide on E-learning strategy (I G E L S)

2) Instructional Guide on modified Lecture Method. (I G M L M)

3) Basic science Achievement test (B S A T)

The instruments were developed by the researcher. B S A T had a reliability coefficient of 0.88 by using Kuder-Richard son formula 21(KR-21).The instruments were validated by experts.   The first week was for the training of the teachers on the use of I G E L S. and I G M L M. The second week was used for the administration of pre test on B S A T. The next two weeks, were used for the treatment of the experimental group (I G E L S) and the control group (I G M L M).The next week, which fell in the 5th week, was used for the administration of the post test .

METHOD OF DATA ANALYSIS:

The data were collected and analysis was calculated by using mean in order to provide answers to the research question, while analysis of COVARIANCE (ANCOVA) was used to test the test the hypothesis for significance at 0.05 alpha levels

RESULTS

The results of the study is presented in line with the research questions and the hypothesis that guided the study

Research questions 1:

What difference exist in STUDENTS achievement in the basic science when taught while E-learning and modified lecture method?

Table:1 Summary of mean and standard deviations of pretest and posttest score of basic science students taught with E-learning and modified lecture method .

Instructional Strategies	N	Pretest Scores		Posttest Scores		Mean Gain Scores
		X	SD	X	SD	
E-Learning	60	45.53	8.07	72.33	8.76	26.8
Modified Lecture Method	44	38.18	8.77	50.59	8.65	12.41
Total	104	42.31	9.031	9.06	63.13	20.82

The table 1, revealed that the pre-test mean score of those taught with E-learning instructional strategy was 45.53 with a standard deviations of 8.07, while those taught with modified lecture methods had a pretest mean score of 38.18 with standard deviations of 8.77. The difference of the mean score was 7.35

The table also shown that the post test mean score of those taught with E-learning instructional strategy was 72.33 with standard deviations of 8.76. A mean gain of 26.80 was recorded compared to their pretest score, while these taught with modified lecture method had a post test mean score of 50.59 with standard deviations of 8.65. A mean gain of 12.41 was also recorded compared to their pretest score. Therefore the post test mean score of those taught with E-learning 72.33 was greater than the post test mean score of taught with modified lecturer method 50.59 . The same result was seen in the mean gain.

This implies that the students taught with E-learning have a greater achievement than those taught with modified lecture method.

Research Hypothesis 1

There is no statistically significant difference in students achievement in basic science when taught with E-learning and modified lecture method.

TABLE 2: One way Analysis of convenience (ANCOVA) of post test scores of students, achievement in basic science when taught with E-learning and modified lecture method.

Source Of Variation	Type Iii Sum Of Squares	Df	Mean Square	F	Sig.Square	Partial Eta	Decision P<0.05
Corrected Modal	12028.552	2	6014.276	78.729	0.000	0.609	
Intercept	13636.767	1	13636.767	178.511	0.000	0.639	
Pretest Scores	28.406	1	28.406	0.372	0.543	0.004	
Instructional Strategies	9738.788	1	9738.788	127.488	0.000 *	0.558	
Error	7715.563	101	76392				
Total	434286.00	104					
Corrected Total	19744.115	103					

R squared=.609 (adjusted R.squared=.601)* significant value rate at $p<0.05$ alpha level.

The result revealed that table:2 shows the main effect that was significant on students 'achievement in basic science ($F_{i,101}=76.392$:pc,0.05; partial eta square =o.558) ,which gave an effect size of 55.8 percentage, therefore the NULL HYPOTHESIS which states that there is no statistically significant difference in students achievement in basic science when taught with E-learning and modified lecture method was not accepted.

DISCUSSION

The findings revealed the students exposed to I GMLM and that the difference was significant. This finding agrees with the findings of Sunday et al 2015, Oleabhiele, 2015 and Oye et al.2012 that the use of E-learning enhances the understanding of basic concept which leads to greater achievements.

This supports the fact that, listening alone is not enough to understand the scientific concepts clearly and correctly, therefore the addition of the sense of sight to the sense of hearing will give more advantage to those students who do not have laboratories to have hand-on and who lack other instructional materials. However the findings disagree with finding of Owino, 2013 that students under the conventional study mode achieved better than those under E-learning mode.

CONCLUSION

The findings of the study have shown that E-learning strategy is an innovative strategy for science teaching especially basic science. Teacher should endeavor to adopt E-learning strategy now that information and communication technology has become affordable to almost every one. Teachers and students should use available technology rather than waiting on government support, since E-learning has been seen to enhance academic achievement of students in basis science.

RECOMMENDATIONS:

Based on finding the following recommendations were made:

1) Government should provide E-learning materials and enough equipment for the secondary schools.
2) Basic science teacher should be trained on E-learning to develop the necessary skills on e-learning mode of teaching.
3) E-learning should be part of the secondary school curriculum.

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