
EFFECT OF INTERACTIVE LECTURE METHOD ON SECONDARY SCHOOL TWO STUDENTS' PERFORMANCE IN MATHEMATICS

**Enyekeme Owouko Ibok, Dr. Mercy Ngozi Nwoye, Ezeorah Lovina Ngozi
& Emenia Chukwudi Ogonna**

Department of Science Education, University of Nigeria, Nsukka
*ngonwoye@yahoo.com

Abstract

This study seeks to investigate the impact of interactive lecture strategy on secondary school students' performance in mathematics. The study adopted a quasi-experimental research design. The study was conducted using a sample size of 62 SS2 students in two intact classes from two public secondary schools in Mkpate Local Government Area, Akwalbom State. The two intact classes were further assigned to the experimental and control groups. Mathematics Performance Test (MPT) was used for data collection. The instrument was subjected to content validity and reliability check which yielded a reliability coefficient of 0.79 obtained using Spearman correlation coefficient. Three research questions were formulated for the purpose of the study and three hypotheses were tested at 0.05 level of significance. Mean and standard deviation were used to answer the research questions while t-test for independent samples was used to test the hypotheses. The finding of the study showed that the students taught using interactive lecture method performed better than those taught using the conventional lecture strategy also there was no significant difference between the performance scores of male and female students taught using the interactive lecture strategy. It was recommended among others that mathematics teachers should employ interactive lecture in the teaching and learning situation, particularly in large class size. Also, school proprietors on their part should provide the necessary facilities required for the effective use of interactive lecture method.

Keywords: Interactive, Lecture Method, Mathematics

Introduction

School is a formal agency of education designed for specific goals. In education in schools, the teaching and learning process is the most basic activity, meaning that learning can be achieved depending on how the results of student learning are explained. Teaching and learning activities consist of several components including: students, educators, and teaching methods and so on, to develop student learning activeness it is necessary to have an appropriate method needed in the subject matter. So that the performance of learning objectives can be achieved and students feel happy, understand the material presented (Fatimah & Mahmudah, 2020).

There are several methods in Islam that can be used or applied to support success in the learning process, one of which is the interactive lecture method (Tambak, 2014). The lecture method is an interaction between the teacher and students through orally (Sagala, 2009). Meanwhile, the lecture method is to speak orally which directly explains to a group of students (Sanjaya, 2010). This thinking has a similarity in that the delivery of material uses orally (Basyiruddin, 2022). To be able to improve students' learning, teaching methods are needed that are easy for students to understand and as interesting as possible so that the learning process can be achieved properly (Raden Rizky et al. 2014). So far, in learning activities there are many obstacles that must be faced by teachers to achieve learning objectives.

One of the obstacles that arose from the results of observations at school was that students were not enthusiastic and the lack of response from the teacher towards students, even though the teacher had done his best in teaching students but the results were not successful. So that students do not understand what has been explained even though students are silent in class and only listen not to chat alone but it makes students sleepy and there is no reciprocity or a response when the teacher finishes explaining. Do they understand enough what is conveyed or to the learners the learning process is not fun? As a result of these problems, it will be examined more deeply by making efforts to

conduct interviews with students and teachers. According to the teacher that what makes students not active is because students depend on the subject matter and the teacher, whereas according to students learning is boring because the teacher is not fun in delivering material that is too serious, monotonous, the teacher is scary, so students are embarrassed and afraid to ask questions, lazy in learning even in doing the exam can do carelessly (Rikawati & Sitinjak, 2020). Based on the results of the findings we can conclude that the activeness of student learning depends on the methods used in learning and the closeness of students to teachers during learning, therefore it is necessary to apply good learning so that active learning is achieved and effective (Shoimin, 2013). Choosing a method in learning that is not appropriate pose big obstacle in the teaching and learning process then the purpose of learning is not achieved if not choose appropriately. With accuracy in choosing a method will make learning effective and efficient so that students easily absorb what is conveyed and increase activeness in learning (Aminah, 2018).

Mathematics is the subject that deals with the study of numbers, figures and relationship (functions) which aid in solving real life situations or problems in our daily activities; as an individual, organization or government (Orok, Ibok & Oton, 2019). Nwoye (2017) view Mathematics as the science of numbers that deals with signs and symbols. The author further describes Mathematics as a bedrock and pillar for Science and Technology, as important core and everyday subject in Nigeria Primary and Secondary. Methods adopted in teaching and learning mathematics are very essential and it serves as a predictor to the academic performance of learners, though Ibok and Esoung (2023) asserted that for the learners to learn any mathematical concept, the learners must either be motivated to do so by the teacher or by themselves. They concluded that the self-efficacy of the learners is a predictor of academic performance of the learners in Mathematics. Though self-efficacy is a predictor, Aminah (2018) still holds firm to the fact that teacher's teaching method is also a predictor of the teaching and learning process in general. Orok, Ibok & Oton (2019) in their study on problem-solving method of teaching Mathematics has highlighted a number of other factors like students' attitude to learning, parents' factors, lack of instructional materials and poor instructional strategies employed by Mathematics teachers as possible causes of students poor academic performance in mathematics and they concluded that problem solving method is a potential factor in the teaching and learning of Mathematics which should be adopted during lesson delivery. Even upon numerous researches, problem of decline in academic performance is still alarming and there is need to re-visit the issue of teaching method. This study sought to reviews interactive lecture approach to the teaching of Mathematics in Secondary Schools in MkpatEnin Local Government, Akwalbom State as a positive tool in alleviating poor performance in mathematics.

Interactive lecturing can be interpreted in a number of different ways. For some, interactive lecturing involves a two-way interaction between the presenter and the participants. For others, it refers to increased discussion among the participants. Interaction can also refer to a student's involvement with the material or the content of a lecture; it does not necessarily mean that the audience has to do all of the talking. Interactive lecture is the type of lecture method that provides the learners with the opportunity to interact with the teachers themselves. In this method, the teacher gives a brief talk and gives room for the learners to contribute or responds after which the teacher fine-tunes or corrects the learners where necessary. The teacher does this by engaging the learners in activities such as think-pair-share, demonstration and role-play (Kola, 2017). The teacher breaks the lecture once in a while to have all the students participate in activity that makes them work with the material.

There has been outcry about the poor state of performance of students in public examination in Mathematics. Some researchers attributed it to lack of instructional materials, teacher factor, poor teacher preparation and dilapidated state of Mathematics classroom in schools as defective predictor of academic performance. These problems if not adequately address will continue to have negative effect on the study of Mathematics in Nigerian schools and will continue create loop holes in the academic performance of Nigerian Students in external examination. To address these problems of students' lack of interest in the subjects, the use of adequate teaching strategies should be adopted. Interactive lecture proposed to improve teacher-student relationship and therefore boost the interest of learners in the subject. Though several studies have been conducted on the effects of interactive lecture on students' performance, such studies are other areas of sciences like Physics, Biology and Chemistry. Study on the effect of interactive lecture on students' performance in Mathematics is not within the research area and this necessitated the need for this study.

Purpose of the Study

The purpose of this study was to investigate the effect of Interactive lecture Method on Senior Secondary School II Students' Performance in Mathematics. Specifically, the study sought to find out the effect of

1. Interactive lecture method on Students' Performance in Mathematics
2. Interactive lectureMethod on the Performance of male and female Students in Mathematics.

Research Questions

The following research questions were raised to guide the study;

1. What are the mean performance scores of the students taught mathematics using Interactive lecture method and those taught with conventional lecture method?
2. What is the mean performance score of male and female students taught Mathematics using interactive lecture method?

Research Hypotheses

The following hypotheses were formulated to guide the study;

1. There is no significant difference in the mean performance score of students taught mathematics using Interactive lecture method and those using Conventional lecture method.
2. There is the no significant difference in the mean performance scores of male and female students' taught mathematics using Interactive lecture method

Methodology

The study adopted a quasi-experimental design, particularly the non-equivalent control group design with pre-test and post-test to determine the effect of interactive lecture on senior secondary two (SS II) students' performance in Mathematics. A total of 42 students (24 in the experimental group and 18 in the control group) took part in the study. Two intact classes from two schools were randomly selected and assigned to the experimental and control groups. The two groups were pre-tested on the pre-test on the concept of plane geometry using Mathematics Performance test (MPT) as the instrument. The instrument was subjected to validation by experts and the reliability coefficient of 0.79 was obtained using PPMC when subjected to reliability check using the test-retest method. The experimental group was taught using interactive lecture while the control group was taught with the conventional lecture method. After the treatment, post-test was administered to both groups. Mean and Standard deviation were used to answer the research questions while t-test of independent samples was used to test the hypotheses at 0.05 level of significance.

Results

Research Question 1: What is the mean Performance score of the Students taught mathematics using Interactive lecture Method and those taught using Conventional Lecture Method?

Table 1: mean scores of the experimental and control group in Mathematics

Group	Number	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD
Experiment	24	39.80	7.27	68.70	8.24
Control	18	39.35	7.71	54.80	7.75

The result in Table 1 shows that in pretest the experimental group had a mean score of 39.80 with standard deviation of 7.27 while the control group had a mean score of 39.35 with standard deviation of 7.71. For the posttest after the experiment, the experimental group had a mean score of 68.70 with SD of 8.24 while the control group had a mean of 54.80 with SD of 7.75. The result shows a difference in the mean scores of the experimental and control groups. The Implication is that the students taught using interactive lecture performed better than those taught using conventional lecture method.

Hypothesis 1: There is no significant difference on the mean performance score of students taught mathematics using Interactive lecture Teaching Method and those using Lecture Teaching Method.

Table 2: t-test analysis showing data analysis carried out on hypothesis one.

Group	Number	Mean	SD	t-cal	t-tab	Df	Decision
Experimental	24	39.80	7.27	4.88	1.96	38	Rejected
Control	18	39.35	7.71				

*alpha = 0.05

Table 2 shows that the calculated t-value of 4.88 at a significant level of 0.05 is greater than the critical t-value of 1.96. This means that there is a significant difference between the mean scores of SS 2 students exposed to Interacted Lecture Method (experimental group) and those taught using conventional Lecture method in Mathematics in favour of those taught using Interacted Lecture Method. Therefore, the null hypothesis was rejected.

Research Question 2: What are the mean performance scores of male and female Students taught Mathematics using Interactive lecture.

Table 3: Mean Score analysis showing male and female Students taught Mathematics using Interactive lecture method.

Gender	Number	Mean	SD
Male	14	68.00	7.90
Female	10	67.00	7.74

The result in Table 2 shows that the male students had mean of 68.00 with SD of 7.90 while the female students had mean score of 67.00 with SD of 7.74. This shows there is a slight difference between the performance male and female of students taught using interactive.

Hypothesis 2: There is the no difference in the mean performance score of students taught mathematics using Interactive lecture Method.

Table 4: t-test analysis showing data analysis carried out on hypothesis two.

Group	Number	Mean	SD	t-cal	t-tab	Df	Decision
Experimental	24	39.80	7.27	0.62	2.021	38	Rejected
Control	18	39.35	7.71				

Table 4 shows that the calculated t-value was 0.62 while the tabulated is 2.101 at 0.05 level of significance. This implies that there is no significant difference on the mean performance scores of male and female students exposed to Interactive lecture method in Mathematics. Therefore, the null hypothesis is accepted.

Discussion of Findings

The findings of this study show that the students taught using Interactive lecture Method performed better than those taught using the conventional lecture method. This implies that Interactive lecture Method in teaching and learning is an active teaching Method that is effective in improving students' performance in Mathematics. The findings of this study is in line with Yohanna et al. (2019), Kola (2017) and Tihoale (2014) which reported that Interactive lecture method is an effective teaching Method that helps to improve students' performance, conceptual understanding and also promotes students' attitude to learning.

The findings also reveal no significant difference between the performance scores of male and female students in the experimental group. The findings of this study also shows that Interactive lecture Method is gender friendly as the mean performance score of male and female students taught Mathematics with the Method showed no significant difference. The finding is in line with the findings of Karadeniz (2011), which reveal no significant differences in the performance score of male and female students. It is evident that Interactive lecture Method is an effective Method that is required in educational settings.

Conclusion

Structured Interactive lectures are better than conventional Lecture Method for teaching Mathematics topics solutions which need mentoring especially among slow learners. As the ease of topic increases both methods evidentially may perform well. With the growth in students' population in institutions of learning and limited resources required to take care of the population, Interactive lecture Method is one of the active Methods that is required for large class size. There is need for Mathematics teachers to embrace Interactive lecture Method in Mathematics lessons particularly for large classes that other Method cannot be defectively used.

Recommendations

Based on these research findings, it is recommended that;

1. Mathematics teachers should employ Interactive lecture in teaching and learning session.
2. School proprietors' should provide conducive environment for effective conduct of Interactive lecture Method mostly in teaching of Mathematics.

Suggestion for Further Study

Based on the findings of this study, the following suggestions were made;

1. Research should be conducted in another field of study with a large sample size to compare the inference.
2. The study should be conducted in another research area to enable generalization.

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