

EFFECT OF CHALK-BOARD MATHEMATICAL SET ON STUDENT'S PERFORMANCE IN FURTHER MATHEMATICS IN SOME SECONDARY SCHOOLS IN BOSSO LOCAL GOVERNMENT AREA OF NIGER STATE, NIGERIA

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ABSTRACT

This study investigated the effect of chalk board mathematical set an instructional material on the performance of student in further mathematics in senior secondary school in a sampled area. Two secondary schools in Bosso Local Government area of Niger State were sample. In Educational setting, most secondary school teachers teach through lecture method the finding shows that secondary school students perform poorly in most subjects (especially further mathematics which could be associated with the method of teaching the subject). This study confirmed the suggestions of some Educationist that teaching students with instructional materials will arouse the interest of students and will improve teaching and learning in all classrooms. The study adopted the pretest experimental control group design. The sample population was made up of one hundred and twenty (120) senior secondary schools class Two (SSII) Students randomly selected from two secondary schools in Bosso Local Government area of Niger State, Nigeria. Pretest and post-test questions were administered to both groups and scores based on a hundred percent (100%). The result is evidently shown in the highest post-test mean score of 56.4 of experimental group compared to the control group mean score of 50.2. One hypothesis was tested at $\alpha=0.05$ level of significance. Data collected were based on pretest of the descriptive statistics via: Mean, Standard Deviation and t-test to arrive at the result in the study.

INTRODUCTION

Chalk-board mathematical set is an instructional material, which is self-supporting device that can be used by instructors and teachers to present a complete body of information in teaching- learning process. It is a visual aid which makes teaching enjoyable, interesting, stimulating and effective. This also equip teacher for effective delivery of the subject. It also improves the performance of the students.

Most secondary school teachers are not used to visual instructional materials mostly due to lack of exposure and adherence to tradition. This obviously leads to poor performance of students especially in practical based subject including further mathematics, which is taught at senior secondary school (SS) level. Many studies have been carried out to identify the cause of the problem of poor performance of students in further mathematics subject in secondary schools William (1980) revealed that lack of modern and up-to date method of teaching and deficient method used today in classrooms are responsible for poor performance of the student in further mathematics. Other studies also revealed that apparent lack of interest in further mathematics by students, anxiety during examinations, refusal to attend further mathematics classes due to poor teaching methods and absence

of appropriate and modern instructional-learning materials, such as visual aid are also responsible for the poor performance of students in the subject.

Researchers have not adequately comprehended the fact that modern instructional technology could be very essential in the teaching of further mathematics. Indeed one common problem, in schools generally today, is that student easily forget what they were taught. The problem often caused by too many theoretical expressions by the teachers while the learners are passive listeners. According to Obianwu (1994) the theories of learning have exposed the very important role, which visual aids can play in the business of education. In a learning situation, three major elements that constitute 'learning elements are; (i) the learner, (ii) the stimulus or stimulus situation and (iii) the response. Any instructional process, which evokes the involvement of many of the human sensory organs, tends to facilitate the permanency in the performance of the students.

Blair and Simpson (1968) revealed that 1% of learning takes place through taste, 1.5% through touch, 3.5% through smell, 11% through hearing and 83% through sight. What this portraits is that students learn more effectively through what they hear and see. Indeed,

since human being learns through their senses, materials that appeal to one or more of the senses must be applied in the teaching and learning process. Therefore, the focus of this paper was aimed at determining the effect of the instrument of chalk board mathematical set instructional material on student's performance in further mathematics in Bosso Local Government Area of Niger State.

The poor teaching method and absence of appropriate and contemporary learning materials such as visual aids in teaching and learning of further mathematics is a serious problem in the sample area and secondary schools in general. Therefore, students will continue to see further mathematics as a very difficult subject, obviously because of poor understanding of the subject. Also, no learning or teaching materials is used to improve their understanding and memory link.

Due to this fact, the objective of teaching further mathematics is less achieved in Bosso Local Government area of Niger State. Having identified the problems of teaching and learning of science subject at secondary level, teachers also face difficulties in the selection and usage of instructional materials to facilitate teaching-learning process. It is necessary therefore, to investigate the effects of the usage of chalk board

mathematical set instructional material on learning science subject at senior secondary schools level of the educational system. the concern of the researcher therefore, is to experiment the authenticity of this opinion using the constructed chalk board mathematical set instructional material, hence this paper seeks to ascertain whether students who actively participates in lesson taught with appropriate method using chalk board mathematical set instructional materials and those that merely observed the teacher without chalk-board mathematical set instructional materials differ significantly in their performance in further mathematics subject.

The paper sought answer to the question below:

To what extend will the usage of chalk-board mathematical set improve the student's performance in further mathematics of either the experimental or the control group?

The hypothesis below formulated in the null form is tested at 0.05 significant levels in order to obtain answer to the research question.

$H(0)$, there is no significant difference in further mathematics achievement mean score of experimental and control group?

The researcher is not aware of the existence of any research data on effective performance of student's in further mathematics in Bosso

Local Government Area of Niger State where chalk-board mathematical set instructional materials were used as teaching aid. It is therefore, hoped that the result of this study will reveal, if there is any significant difference between the groups taught using chalk-board mathematical instructional materials and the group taught without chalk-board mathematical set instructional materials. It is further hoped that the result will supply the missing link in the area and constitute a source of help to develop and promote the knowledge of teachers in secondary schools and also to acquaint the educational planners, school administrators and implementers of school curriculum with the necessary information on the need to equip schools with appropriate contemporary equipment and instructional material for effective teaching and learning of various science subject generally and in particular further mathematics.

METHODOLOGY

Sample: A total of 120 senior secondary (SSII) students made up the sample. The students were drawn from two randomly selected public secondary schools in minna, Niger State. One school for the experimental group and the other formed the control group. The SSII further mathematics students in each of the schools were used for the study.

INSTRUMENTATION

The instrument consists of five theoretical questions on construction in further mathematics drawn from past senior secondary school certificate examination (SSCE) and NECO questions. An expert in further mathematics validated the test question before use. The test lasted for one hour and was supervised by the researcher. The validated marking scheme was used to score students work each correct answer earns one mark and any wrong answers earns zero. The total score are then converted to percentage. The data obtained from the pre-test and post-test were analyzed statistically using the mean, standard deviation and t-test statistics.

DESIGN AND PROCEDURE

A pre-test, post-test and post-test experimental and control group design was adopted for the purpose of data collection. In the first instance, a pretest was administered to both the control and experimental group. The pretest was followed immediately by four weeks teaching of the further mathematics on construction of different angles. The experimental group was taught using chalk-board mathematical set instructional material. The teaching involved discursion, demonstration and activities. This treatment was withheld from the control group. The control group was taught using

traditional method. Then the post-test was to determine the performance of the experimental group. The data collected were then analyzed using the mean, standard deviation and t-test statistics.

DATA ANALYSIS AND DISCUSSION

The data for the study were analyzed using the mean, standard deviation and t-test statistics of the pretest, posttest and post-test.

Table 1: Pre-Test Score for Experimental and Control Groups-on Pretest Scores

Groups	N	df	Mean (X)	Standard Deviation	Critical t-value
Experimental	60	49	58.6	9.60	0.19
Control	60	49	52.4	10.00	0.19

Ns=not significant at the 0.05 level.

Table 1 showed the result of analysis of the pretest scores of the experimental and control groups. The pretest analyses were to determine whether the means and standard deviations of the two groups differed significantly. The results indicated that the groups at 0.05 level were equivalent before the treatment (t=0.19).

Ho: there is no significant difference in the achievement mean scores of students taught further mathematics with chalk board mathematical set instructional material and those taught without the chalk board mathematical set, in the pretest.

Table 2: Post-Test results for Experimental and Control Groups-Scores

Groups	N	df	Mean (X)	Standard Deviation	Critical t-value
Experimental	60	49	58.6	9.60	0.19
Control	60	49	52.4	10.00	0.19

Ns= not significant at the 0.05 level

Table 2 presents the t-test comparison of the posttest mean scores of the experimental and control groups. The mean score for the Experimental Group was 58.6 and that of control Groups 52.4 .The calculated t-value critical

(14.85); this indicates that there is statistically significant difference between the mean score of the experimental group (14.85) and control group (13.05) at the 0.05. Hence H_{01} is rejected. The Experimental Group exposed to

chalk board mathematical set instructional material on construction performed better than the control group.

Conclusion

The introduction of technology in Universities has improved the quality of life. Its impact in teaching and learning has tremendously changed the method of teaching in many parts of this country. It also equips teachers of technology with the knowhow on providing and utilizing instructional materials. This study is an eye opener to the fact that all teaching and learning exercise most be carried out using instructional materials if there must be improvement in the performance of students.

Recommendation

In view of the research finding above, the study therefore recommends that

1. Government at all level should encourage the use of instructional material in secondary schools. By providing necessary resources and man power.
2. The ministries of education at all level should organize seminar, workshops and conferences for school teachers in order to equip them with relevant skills needed for capacity

- building (improved teaching process).
3. Provide incentives such as in-service training, improve salary, regular promotion, award for school teachers to boost their morale.
4. School inspectors at all levels should ensure adequate supervision of schools and provision of instructional materials.
5. Curriculum planners and developers should make instructional materials skills compulsory at all level of education for teachers.

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