

Effects of Peer Tutoring Instructional Method on the Academic Achievement in Biology among Secondary School Students in Zaria Metropolis, Nigeria

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ABSTRACT

*The study investigated the effect of peer tutoring instructional method on the academic achievement in Biology among secondary school students in Zaria Metropolis, Nigeria. The design for the study was pretest and posttest experimental control group design. All the 60 senior secondary schools within Zaria metropolis constituted the population of the study. Two senior secondary schools were randomly selected and made into experimental and control groups. Biology Achievement Test (BAT) was prepared by the researcher and validated by Two senior lecturers from education department, Ahmadu Bello University, Zaria and a reliability coefficient $r=0.67$ was arrived at. Biology Achievement Test (BAT) was administered to the students by the researcher. Data collected were analysed using *t*-test statistics. The results indicated that students taught biology using peer tutoring instructional method achieved higher than those taught using expository method. It was recommended that, teachers need to diversify their method of teaching biology such as peer tutoring as it will assist in higher academic achievement of learners.*

Keywords: Peer tutoring, instructional method, academic achievement, Biology

INTRODUCTION

Education is an instrument for economic, political and scientific development of all nations (Olarinoye, 2001 and Otuka, 2006). This could be the reason why the Federal Government of Nigeria emphasised the Teaching of Science in its National Policy on Education (FGN, 2008). Despite all the efforts of the Federal Government of Nigeria in the said document there still exist some report of poor academic performance among secondary school students in public examinations in sciences. Adebayo (2011) reports that the failure rate in mathematics and sciences in the May/June, 2011 West African Senior Secondary School Certificate Examination was a reflection of the disconnect between teachers and their pupils, hence, the need for a new approach to bridge the gap in classroom learning.

Similarly, Omole (2011) is of the opinion that 75% failure in mathematics and sciences is worrisome, there is the need to identify teaching methods that students can relate with and share ideas and interact academically within themselves. It has been pointed out by researchers such as: Awodi (1984), Danjuma (2005), chief Examiners (WAEC 2008) and Ayuba (2011) that there exist poor achievement in sciences (biology inclusive).

This poor performance, according to Danjuma (2005) might be due to poor method of teaching and insufficient instructional materials. Despite that using activity-based instructional method such as problem-solving instructional method, cooperative learning the students performance is still below expectation, therefore peer tutoring will be employed to see whether it will improve students' academic achievement in biology or not. Peer tutoring instructional method is the process by which a learner, with guidance from a teacher helps one or more students at the same grade level to learn a skill or concept (Paul, Lisa and Vanesa, 2006). Also, Peer tutoring instructional method has been described as a type of cooperative learning which is effective at increasing students academic achievement at various educational levels (Slavin, 1991). Peer tutoring is an instructional strategy that consists of student's partnership, where a student teaches his peers, linking high achieving students with lower achieving students or those with comparable achievements. The pairing of higher and lower-achieving students is intended so that students gain knowledge from each other through practice and reinforcement (Fuchs D., Fuchs L., Thompson, Stevenson, Kazdan et al, 2002). In all exercises involved in peer tutoring the teacher serves as a facilitator. Science educators such as Ayuba (2011) considered peer tutoring as one of the effective and powerful instructional methods that can be used to develop academic as well as social skills in both the tutor and the tutee (the learner).

In a peer tutoring class each student gets more attention from the tutor and more time to speak while others listen. This allows the students to take an active part in constructing their knowledge. Also this approach focuses on peers to solve a problem, and is most effective in fostering creativity, experimentation, problem-solving skills and the learning of difficult concepts in science and technology (Williams, Wiebe, Yang, Ferze and Miller, 2006). The teacher serves as a facilitator in using peer tutoring instructional method. Ayuba (2011) in his research on the impact of peer tutoring on the academic performance of junior secondary school students in sciences concluded that students taught using peer tutoring performed better than those taught sciences using lecture method. Also Maryllyn and Bryan (1998) investigated the effects of reciprocal peer tutoring on the academic achievement, self-efficacy and test anxiety of University students in Georgia. The result indicated that those exposed to peer tutoring performed better than those exposed to using lecture method in academic achievement. The present study is to determine the effect of peer tutoring instructional method on students' academic achievement in Biology in Zaria Metropolis of Nigeria.

The main purpose of this study is to determine the mean academic achievement of students taught biology using peer tutoring instructional method and those taught using expository method. A research question was generated to guide the study. Thus, Is there any significant difference in the academic achievement of students taught biology using peer tutoring instructional method and those taught using expository method. A comprehensive research hypothesis was formulated in a null form to tentatively answer the research question. Thus, there is no significant difference in the academic achievement of students taught biology using peer tutoring instructional method and those taught using expository method.

METHOD

This research design is Quasi- experimental Control group research that employed pre test posttest method. Pretest was administered before the treatment. This is to determine the equivalent in their academic ability. Posttest was administered after the treatment to determine the effect of the treatment (peer tutoring instructional method) on the subjects. This was done using the same instrument (Biology Achievement Test). Experimental group received treatment which is peer tutoring instructional method while Control group was taught using lecture method.

The population of the study was all the sixty Senior Secondary Schools II that were located in Zaria Metropolis with a total of 21,500 Senior Secondary School Biology Students from public schools. Two Senior Secondary Schools were randomly selected from Zaria Metropolis using 'balloting method' from the area of the study. In each school selected intact class of Senior Secondary II Students were used. And the two schools were divided into experimental and control groups using odd and even number method where the odd number school becomes the control group while the even number the experimental school. A twenty multiple items Biology Achievement Test (BAT) developed by the researcher was employed for data collection. The instrument (Biology Achievement Test) was validated by two PhD holders and Senior lecturers from the department of Education, Ahmadu Bello University, Zaria and two B.Ed holders and Senior Secondary School Biology teachers. They made same recommendations on the areas of content and appropriateness of the language and the instrument was corrected and used for this study. The reliability test of the instrument was conducted at Kofar Wambai Secondary School in Bauchi Metropolis of Bauchi State which is outside the study area to ensure that the instrument was consistent. A test retest method was employed to the same respondents after two weeks interval in line with Tuckman (1975) recommendation. The results of the test were correlated using Pearson Product Movement Correlation Coefficient (PPMC) the reliability coefficient (r) was found to be 0.67 which shows that the instrument is reliable and was used to collect data for the study.

Since there are two groups for the study that is the experimental and control groups, respectively, lesson plan was developed by the researcher for experimental group using peer tutoring instructional method and control group using lecture method for the period of six weeks. Pretest was administered to the groups to determine the equivalent of the ability level of the sample subjects. The results indicate no significant difference in their ability level.. The teaching in both the experimental and the control groups were done by the researcher. This lasted for six weeks. The researcher then administered posttest using self-efficacy test to the students using the same instrument and marking scheme. The instrument was reshuffled after the pretest to avoid test wiseness. The scripts were collected and marked, and the scores subjected to statistical analysis. The Data collected from both the experimental and control groups were subjected to t-test statistics at $P>0.05$..

RESULTS AND DISCUSSION

Table 1: t-test analysis between the mean academic achievement of the experimental and the control groups

Group	N	X	S.D	df	t-cal	t-crit	Remark
Experimental	50	12.22	2.70	102	11.71	1.96	Sig.
Control	54	6.58	3.08				

Table 1 shows that at 0.05 level of significance, for one tailed test the t-cal 11.71 is greater than the t-crit 1.96. Therefore, the null hypothesis is rejected. Hence a significant difference exist between the experimental and control groups in favour of the experimental group. Results of the research question show that students that received instruction by way of interaction with their peers achieved better than students exposed to the expository method. This was tested in the t test analysis of table 1 which revealed a significant difference in the mean academic achievement of students who were taught biology using peer tutoring instructional method and those exposed to expository method. This result is an agreement of the finding of Ayuba (2011) who reported that peer tutoring instructional method enhances academic achievement of students among junior secondary school students in Bauchi Metropolis. In addition, studies have shown that peer tutoring has resulted in significant academic gains for both tutors and tutees (Ayuba, 2011).

The result is a proof of the earlier submission that peer tutoring instructional strategy is considered by many educators such as Ayuba (2011) to be an effective and powerful instructional strategy that can be used to enhance academic achievement in the tutor and the tutee in teaching and learning biology. Also, Uwameiye (1993) reports that the students taught using peer tutoring achieved better results than those exposed to using lecture method. This agrees with Slavin (1991) who concludes that peer tutoring is a form of cooperative learning, which has been found to be an effective technique for increasing students' academic achievement. It has been suggested earlier by Abdullahi (1982) and Danjuma (2005) that since students were actively involved in learning process and were able to find out some information for themselves through activity-based instructional strategy such as peer tutoring instructional method and teaching technique therefore, knowledge is better facilitated.

CONCLUSION

From the study it was concluded that peer tutoring instructional method is one of the effective methods of teaching biology at the Senior Secondary School level, since it shows potentiality of improving student's academic achievement. Based on the findings of the study, the following recommendations were made, that teachers need to use peer tutoring instructional method so as to improve the academic achievement of students in Biology. There is the need for training of biology teachers on the effective use of peer tutoring instructional method in teaching biology. Facilities should be provided by all levels of the governments as well as PTAs and NGOs for effective use of peer tutoring instructional method for teaching in senior secondary schools

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