



Effects of Demonstration Teaching Method on Senior Secondary School Students' Academic Performance in Biology in Ekiti State, Nigeria.

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Abstract

The study investigated the effects of demonstration teaching method on senior secondary school students' academic performance in Biology in Ekiti State, Nigeria. One null hypothesis was generated and tested at 0.05 level of significance. The study adopted quasi - experimental design of pre - test, post-test, control group type; Ninety seven (97) Biology students selected through multistage sampling technique were involved in the study. Biology performance Test (BPT) was the instrument used. The objective was to find out differences in academic performance of students taught with demonstration teaching method and conventional method. Data collected were analyzed using mean, standard deviation. Inferential statistics of Analysis of Variance (ANOVA) and T-test were used to test the hypotheses. The findings of the study revealed that there was a significant difference in the post - test mean scores of students taught with demonstration teaching method and conventional method. Based on the findings, it was recommended that during Biology lessons, teachers should adopt the use of demonstration teaching method to enhance student's academic performance.

Keywords: Demonstration method, Academic performance, Public school, Conventional method, Biology.

Introduction

Biology is the study of plants and animals (Michael, 2015). It is one of the science subjects studied at the senior secondary school level in Nigeria up to certificate class. It paves way for scientific investigation, It helps to understand the benefits of nature to man, and contributes a great deal to research. Biology is a very important science subject and a pre-requisite to many field of learning like Pharmacy, Medicine, Agriculture and Nursing.

Teaching is an act of impacting knowledge to a learner (Okenze, 2016). In the teaching and learning of Biology, there are different types of teaching methods which can be used to impact knowledge to students effectively. Appropriate teaching methods give rise to an enriched learning and environment and hence better learning outcome (Uche and Awujo 2014). Some of which are cooperative method, discussion method, problem solving method, demonstration method among others.



Demonstration teaching method is an approach which involves showing a particular procedure or skills to the students who after careful teaching and learning and interaction repeat and practice the same process shown to them, this can be used when the available resources or equipment cannot go round for each individual in the class. The teacher or some group of students usually carries it out. The approach teaches certain techniques or skills, theory, practice. Demonstration teaching method is a teaching method which involves experimentation (Igboegwu, 2012). It involves the teacher or the student showing activities in front of a class and explaining it as he proceeds. Though demonstration activities are often defined to embrace laboratory experiments, the mode of communication prevalent in demonstration teaching method is a two way communication in which the teacher communicates with the students and the students also communicate with the teacher. The purpose is to ask students to acquire the requisite skills or to procure related knowledge. In the discipline of science, demonstration teaching method has a long history of usage and it basically entails showing how certain scientific equipment operates or a certain operation in science serves to explain a given concept.

Demonstration teaching method may be subjected to pose a problem that requires a solution or to illustrate a problem in order to ensure a quick arrival at the solution. Similarly,

demonstration teaching method may be applied to precede or to follow a discussion, or it may be used to illustrate the application of a principle. As a rule, demonstration teaching method is jointly used with other skills such as explaining, discussing and performing. It can be used to introduce a lesson and to climax a lesson, it is an attention inducers and a powerful motivator when it is employed to start a lesson, saves time, where materials and time are very important. The teacher also shows the correct use of equipment and apparatus through demonstration teaching method. It allows the teacher to handle activities that ordinarily would be too dangerous for students to carry out themselves e.g. an activity involving dangerous chemicals. However, if Biology teachers are equipped with appropriate teaching method, teaching and learning will be effective.

It has been observed that teachers maximally stick to conventional method while few occasionally use demonstration method which makes science students view Biology concepts as a wide and difficult subject to understand. It has also been noted that conventional teaching method is inflexible and does not allow for students' input because of the inadequate teaching method used by the teacher to teach concepts in Biology; teachers need to discover effective teaching method in order to improve academic performance of students in Biology.

There are different teaching methods



employed in science education in Nigeria secondary schools especially in the study of Biology. Miles (2015) asserted that it is expected of a teacher to implement a range of instructional methods that will bring academic success to all the science students. According to Al-Rawi (2013), demonstration teaching method is effective in teaching skills of using tools and laboratory experiment in science. Interestingly, students often find demonstration teaching method easy because it helps them understand and remember new concepts. This is especially evident when teacher tries to convey complex topics such as those that occur in sequential steps. Sweeder and Jeffery's (2013) stressed that if demonstration method is planned properly, and are effectively integrated into the learning of concepts, it has the potential to play an important role in students developing a deep and rich understanding of the concepts taught in Biology.

Demonstration teaching method is likely to be a useful method of teaching because according to McKee, Williamson, and Rue bush cited in Kola and Langenhoven (2015), it improves students' understanding and retention. Compared with traditional method of teaching such as lecture method, several studies have shown demonstration teaching method to have comparative advantages. For example, Price and Brooks (2012) claimed that demonstration teaching method improve students' academic performance on practice assignments, laboratory investigations, as well as

enhance student's understanding of concepts. Another study conducted by Tamari, Bonney and Polizzotto (2015) in Biology revealed that students learn more effectively and perform better on questions that relate to demonstration teaching method than on questions related to lessons that do not have a demonstration component.

Thus, the authors concluded that demonstration teaching method is a valuable tool to promote active and interdisciplinary learning, along with other activities. The study therefore seeks to examine the effects of demonstration teaching method on senior secondary school students' academic performance in Biology in Ekiti State, Nigeria.

Statement of the Problem

The researcher observed that conventional method does not allow students to think on their own instead they depend on the teacher to tell them everything base on the concept to be taught by the teacher which might have contributed immensely to the poor performance of students in Biology. The need to exploit other teaching methods to improve academic performance of students in Biology is expedient. Therefore, the researcher investigated the effects of demonstration teaching method on senior secondary school students' academic performance in Biology in Ekiti State, Nigeria.

Purpose of the Study

The study investigated the effects of demonstration teaching method on



senior secondary school students' academic performance in Biology in Ekiti State, Nigeria. The study also examined the differences in academic performance of students taught with demonstration method and conventional method.

Research Question

This research question guided the study:

1. What is the effect of demonstration teaching method on senior secondary school students' academic performance in Biology in Ekiti state?

Research Hypothesis

One hypothesis was formulated for the study:

1. There is no significant difference in the post - test mean scores of students taught using demonstration teaching method, and conventional method in Biology.

Methodology

The population used for the study was all Biology students in (SSSII) in all public senior secondary schools in Ekiti State and the sample was 97 senior secondary school Two (SSS II) Biology students from three selected schools using multistage sampling technique. The study adopted quasi - experimental research design of pre - test, post - test, control group type. The instrument used for data collection was Biology Performance Test (BPT). To ensure the validity of the instrument, it was subjected to face and content validity and to establish the reliability of the instrument, the instrument was tested with twenty five (25) students,

who were outside the main study, and a reliability coefficient of 0.75 were obtained using Pearson's Product Moment Correlation Analysis. Descriptive statistics of frequency counts, mean and standard deviation were used to analyze the data collected. Inferential statistics of Analysis of Variance (ANOVA) and T - test were used to test the hypotheses. All hypotheses were tested at 0.05 level of significance.

Results

Descriptive Analysis

Research Question 1: What is the effect of demonstration teaching method on senior secondary school students' academic performance in Biology in Ekiti State?

In order to answer the question, students' scores in Biology Performance Test in both pre-test and post-test for students in the demonstration and conventional group were collated and computed using descriptive statistics. The result is presented in table 1.



Table 1: Mean and standard deviation of senior secondary school students' academic performance using demonstration teaching method and conventional method in Biology

Methods	N	Pre - test		Post - test		Mean Difference	Ranking
		Mean	SD	Mean	SD		
Demonstration	49	5.90	1.86	43.08	3.41	37.18	1 st
Conventional	48	6.19	2.36	14.48	4.27	8.29	2 nd
Total	97						

Table 1 shows that students exposed to demonstration teaching method and conventional method of teaching had mean scores of 5.90 and 6.19 respectively prior to treatment; hence, the groups were homogenous at the beginning of the experiment. On exposure to treatment, students taught with demonstration teaching method

had higher mean score of 43.08 than those in the conventional method with a post-test mean score of 14.48. This implies that the use of demonstration teaching method improved students' academic performance in Biology in Ekiti State. The result is further presented in Fig. I

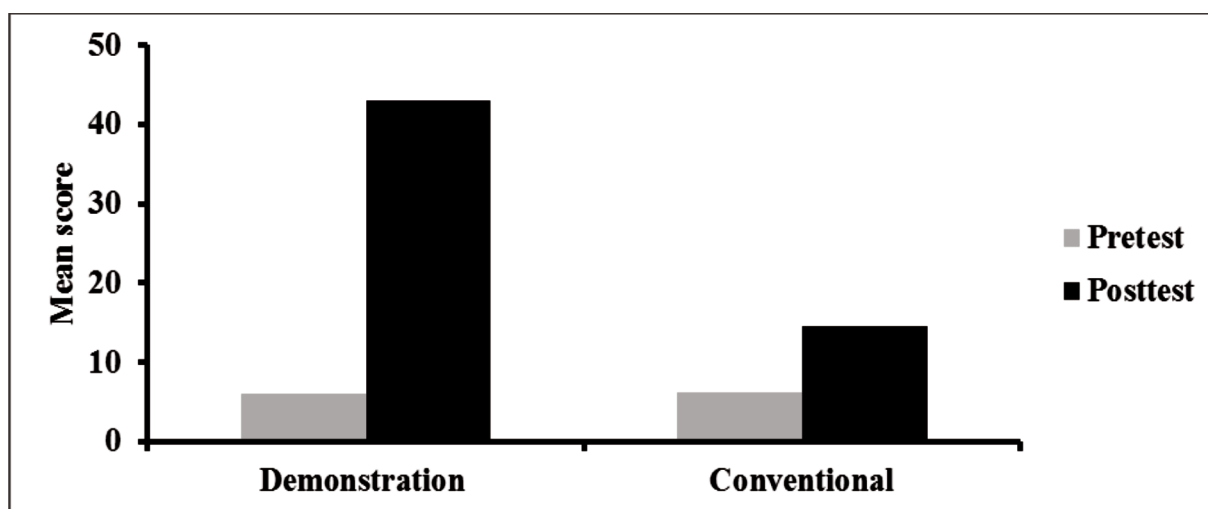


Figure I: Bar chart representation of the effect of demonstration teaching method on senior secondary school students' academic performance in Biology in Ekiti State.

Testing of Hypothesis

Hypothesis 1: There is no significant difference in the post-test mean scores of students exposed to demonstration teaching method and conventional method used in teaching Biology.



Table 2: t-test of Post-test mean scores of senior secondary school students' academic performance using demonstration teaching method and conventional method in Biology

Group	N	Mean	SD	df	T	P
Demonstration	49	43.08	3.409	95	36.511*	0.000
Conventional	48	14.48	4.268			
Total	97					

* $p < 0.05$

The result in table 2 shows that ($t_{95} = 36.511$, $p < 0.05$). The null hypothesis was not accepted. This implies that, there was a significant difference in the post-test mean scores of students exposed to demonstration teaching method and conventional teaching method.

Discussion

The findings of the study showed that exposure of students to demonstration teaching method enhanced students' academic performance in Biology than conventional method. This result is in line with Sweeder and Jeffery's (2013) who found out that, if demonstration method is planned properly, and are effectively integrated into the learning of concepts, have potential to play an important role in students developing a deep and rich understanding of the concepts taught in Biology.

The findings also showed that there was a significant difference in the post-test mean scores of students exposed to demonstration teaching method and conventional method in the teaching of Biology, this was discovered in students who had been

exposed to demonstration teaching method when studying concepts in science and those students who had not been exposed to demonstration with respect to the comprehension of concepts. The result is in line with Price and Brooks (2012) who claimed that demonstration teaching method improve students' academic performance on practice assignments, laboratory investigations, as well as enhance student's understanding of concepts.

Conclusion

Based on the findings of this study, it could be concluded that the two groups (demonstration, and conventional teaching methods) were homogenous at the commencement of the experiment during pre - test. On exposure to treatment, students taught with demonstration teaching method performed better than conventional teaching method. The use of demonstration teaching method enhanced better academic performance of senior secondary school students in Biology than the conventional method. It was also concluded that, despite conventional



teaching method has been used for educational progress over the years, demonstration teaching method was used as a means of diversifying classroom activities and meeting the needs of this present day technological development, also enables students to understand the concept taught and apply the concept in a new situation.

Recommendations

Based on the findings, the following recommendations were made:

1. Teachers should adopt the use of demonstration teaching method in order to enhance students' academic performance in Biology lessons.
2. Teachers should allow students to repeat the experiment demonstrated to them and correct them where necessary.
3. Students should endeavour to follow teachers' instructions during laboratory experiments.

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