EFFECT OF FIELD TRIP STRATEGY ON STUDENTS' ACHIEVEMENT IN BIOLOGY IN DEKINA LOCAL GOVERNMENT AREA OF KOGI STATE, NIGERIA

BY

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Abstract
The study investigated effects of field trip teaching strategy on students' achievement in biology in Dekina Local Government Area of Kogi State. Two objectives, two research questions and two hypotheses guided the study. The design adopted for this study was a quasi-experimental design. The population of this study comprised of three thousand two hundred and forty (3,600) senior secondary school two (SSS II) students in the area of the study. One hundred and sixty two (160) SSS II students were drawn by purposive sampling technique from two co-educational secondary schools in Dekina Local Government Area. The instrument for data collection was biology Achievement Test (BAT). Kuder-Richardsons formular (k-R-20) was used to determine the reliability coefficient index for BAT which was 0.85. After administering the instruments, data were collected. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. The results of the study revealed that students taught basic science using field trip strategy did significantly better in achievement than those taught using conventional method. The result also revealed that field trip strategy has a significant effect on male and female achievement in biology. Based on the findings, it was recommended among other things that biology teachers should use interactive strategies such as field trip strategy to teach biology in order to improve students' academic achievement.

Keywords: *Field trip teaching strategy, Achievement, Biology, Gender*

Introduction

Science is the methodical study of the world around us as a branch of knowledge. Scientific knowledge is the sum of all knowledge gained from such studies. Furthermore, science engages with nature by observing it and then doing experiments on it (Anaso, 2017). Students are exposed to a variety of science teaching and learning methods and strategies in science education. Depending on the component to be taught, these include lecture, demonstration, discovery, discussion, laboratory activities, cooperative learning, and so on. Usman (2018) describes science as a branch of a wide body of knowledge that includes subjects like as biology, chemistry, physics, geology, and astronomy, to name a few.

Different scientists have described biology as a branch of the general body of knowledge (science) based on their perceptions and understanding of the subject. Biology, according to

Kalu (2017), is the science of life. Biology, as a life science, is concerned with the features of living organisms, such as their forms, functions, and interactions with one another and their surroundings, among other things.

However, for efficient biology education, using a method/strategy that makes use of the environment can achieve a lot and help students understand the topics. Biology is the most popular of the science subjects (chemistry, physics, and biology) (Ibrahim, 2018). It is a key (obligatory) topic in practically all Nigerian Senior Secondary Schools. A fundamental understanding of biology is also required for a variety of professions, including medicine, agriculture, pharmacy, microbiology, biochemistry, and psychology, to name a few (Bichi, 2013). As a result, a technique that will help pupils understand biology concepts should be implemented. The purpose of this study is to see how field trips affect students' academic progress and retention in biology concepts at the university level.

Biology is essential to a country's economic prosperity. Because of recent advances in biochemistry, physiology, ecology, genetics, and molecular biology, according to Ajaja (2018), the subject has become a central focus in most human activities, including solutions to the problems of food scarcity, pollution, population explosion, radiation, disease, health, hygiene, family life, poverty eradication, management and conservation of natural resources, as well as biotechnology and ethics. Due to immense benefits of the subject (Biology) to both individual and societal development, the Federal Government of Nigeria, in the National policy on education, (NPE, 2021), made biology a core science subject at the senior secondary school (SSS). The objectives of biology Programme are: Adequate laboratory and field skills in Biology; Meaningful and relevant knowledge in biology; Ability to apply scientific knowledge to everyday life in matters of personal and community health and Agriculture; Reasonable functional scientific attitudes and emphasis of content and context of the syllabus is placed on: field studies, guided- discovery/Biology as inquiry (NPE, 2014). Thus, from the above objectives, an outdoor strategy such as field trip method has been recommended by FME for its implementation for the accomplishment of biology objectives in universities in Nigeria. However, despite the recommendation on field trip method as a strategy for teaching biology, many biology lecturer in the various universities still teach biology concepts using only traditional method or lecture method. There are different branches or concept of biology and there are different ways of dealing with them effectively. For instance, there is anatomy and physiology, genetics, evolution, nervous co-ordination, among others, much of which can be taught effectively by demonstration, discovery, lecture method, activity based in the class room and/or indoor laboratory. There is an aspect in biology that is referred to as ecology that requires students to be taken out to see living organisms in their natural habitats.

Aliyu, (2018) observes that field trip method is taking students out of the classroom to places where they can see concrete illustration of classroom theories. It also offers direct observation and interpretation of the substance in their natural surroundings. It is on the spot requires the use of basic scientific skills that is observation, identification, classification and manipulation of substance in the natural surroundings. It provides real life context for the material being learned. It can make more sense and be remembered better if students can actually see where and how they work or take place in reality. This is in line with a Chinese

proverb cited by Ukairo, (2018) that says; What I hear, I forget; What I see, I remember; and What I do I understand.

However, field trips are not the only approach or strategy for effective teaching and learning of topics in biology that can be geared toward individual training through child-centered learning for optimum self- and social development. Problem solving, enquiry, questioning teaching technique, discovery approach, concept mapping, and so on are some of the strategies available. All of these methods could be utilized to teach various ideas in biology in order to make learning more effective, meaningful, and relevant. Some of these methods, on the other hand, cannot all be employed effectively in the teaching and learning of environmental concepts. As a result, the study looked into students' academic progress and capacity to retain biological concepts using the field trip method of instruction. Some biology teachers on the other hand, do not diversify in their teaching methods. They lecture on all parts of biology (Okafor, 2012), which may be one cause for students' low performance in this subject (Biology). And it's past time for science teachers to change the methods/strategies they employ to teach the many parts for effective measures, so that students can learn more, retain more, and apply what they've learned through meaningful activities. The study focuses on the influence of field trip method on biology student's accomplishment in biology, which may enable the students participate fully in set out activities, with the goal of boosting students' learning in biology.

The lecture method is a teacher-centered method that is similar to the old talk chalk method of teaching, in which the teacher performs all of the talking and the students merely listen and take notes. The lectures approach, according to Obeka (2019), is a teacher-centered method. It goes on to say that the method entails the acquisition of subject knowledge, which is normally done by memory, as well as the teacher's close observation of the students. The lecture technique, on the other hand, does not necessitate the use of fundamental science skills (observation, identification, classification and manipulation of substances in their natural environment). As a result, it cannot be used effectively in the teaching and learning of some biological concepts. Instead, combining a field trip teaching strategy with a lecture teaching style may help students obtain better academic results. As a result, a teaching strategy is simply defined as a process-oriented model that allows teachers to deliver ideas and concepts at a number of levels in order to satisfy the needs of a diverse group of students. According to Ajaja (2018), the field trip approach fits within the category of teaching strategy because of the participants' strong potential for hands-on learning. It's also thought to be a nice day off from school. The field trip method allows students to see principles acquired in class applied in the real world through firsthand observation of organisms in their native context. The influence of the field trip method on students' academic achievement in biology was explored in this study.

Academic success is determined by the amount of intellectual stimulation a youngster can acquire from a learning scenario (Obeka, 2019). On the other hand, Oka and Samuel, 2020) claimed that academic achievement is linked to mental health care. Physical health and intellectual skills, he claims, are the foundations of mental health, leading to appropriate means of adjustment, social sensitivity, and an adequate self-concept. As a result, scientists

such as (Nnachi, 2017; Kalu, 2017 and Ibrahim, 2018) are concerned with ways to increase students' academic proficiency and retention in science, particularly biology.

Apart from achievement another variable considered in this study is gender. Webster, (2019) referred to gender as roles assigned to male and female in the society. This is verifiable because, there is a general belief among Nigerians that males are superior to females in terms of physical physique, cognition, logical reasoning and even superior in academic achievement (Anigbogu, 2019). In Nigeria, also, it is believed that science subjects like physics, mathematics, chemistry and physics are male dominated subjects (Anigbogu, 2019). While others have a counter opinion for instance, Okeke (2017) was neutral in his view as regard gender differentiation in some of the science courses. Consequently, gender differentiations that exist in some science related subjects, which lead to variation in academic achievement of male and female students remain an issue of concern to researchers. However, other factors that can influence academic achievements of students are social, economic, medical/health, familial, relationships between teachers and students and school expectation among other things.

Biology is the bedrock for many science courses such as medicine, pharmacy, nursing, and agriculture among others. In spite of the high number of students' enrolment in biology in Senior School Certificate Examination, studies by (Sussan and Ebele, 2021 and Chief Examiner's Report, 2021) have shown that students' achievement in biology in the external examinations is poor. The poor achievement of students in biology in external examination is linked to the use of traditional method (lecture method) in teaching secondary school basic science (Ibrahim, 2018). The inadequacy of traditional teaching methods account for this study which is set to determine the effect of field trip strategy on students achievement in biology in Dekina Local Government Area of Kogi State, Nigeria.

Methodology

The design adopted for this study was Quasi-experimental design. Because it involves the administration of pre-test and post-test to respondent in their intact classes. This design was used because random assignment of subjects to experimental and control groups.

The study was conducted in Dekina Local Government Area of Kogi state. The area is one of the 21 local government areas in Kogi State with its headquarter in the town of Dekina. The LGA is made up of numbers of town and villages such as Ologba, Ulaja, Birdu, Agala, Egume etc. Educationally, the area has about sixty three (63) public and private secondary schools.

The population of this study will comprised of all senior secondary school two students in schools in Dekina education Zone of Kogi state. These populations comprised the whole students in the sixty three (63) secondary schools the Local Government. The year one senior secondary students was chosen as the study subjects because biology is taught in SSS1I as part of their curriculum.

The student's samples for this study will comprise of 100 students in year two senior secondary students from two co-educational secondary schools in Dekina Local Government

Area. Purposive sampling technique was employed to sample two co-educational secondary schools That is, one experimental school and one control school. And from each school fifty (50) students were chosen in Senior Secondary SS1 Class.

The instrument for collecting data for the study was Biology Achievement Test (BAT). The BAT is a twenty (20) item multiple choice questions which will developed by the researcher from the Biology content area used in year one senior secondary. The instrument has options A-D for each of the item. The items were drawn using the following curriculum unit in the senior secondary school science curriculum (Ecology). The BAT was face validated by three (3) research experts in Science Education Department, Prince Abubakar Audu University, Anyigba and the research supervisor. The reliability of BAT was determined using Kuder-Richardsons formular 20 (k-R20) which is 0.85.

Pretest were administered to subjects in both experimental and control schools before commencement of teaching using lesson plans for experimental group and control groups for three weeks. This was followed by administering of posttest to students in both experimental and control schools. The data collected from the pre-test and post-test was analyzed using means and standard deviations. Hypotheses were tested at 0.05 level of significance using Analysis of Covariance (ANCOVA).

Purpose of the Study

The main purpose of this study was to investigate the effect of field trip method on student's academic achievement in biology. Specifically, the study seeks to:

i. Determine the difference in the academic achievement of students taught biology using field trip method and those taught using lecture method.

ii. Determine the difference in the academic achievement of male and female biology students taught biology using field trip method.

Research Questions

The following research questions are set to guide the study;

(i) What is the difference in the mean achievement scores of students taught biology using field trip method and those taught using lecture method?

(ii) What is the difference in the mean achievement scores of male and female students taught biology using filed trip method?

Research Hypotheses

This study has the following null hypotheses:

Ho_1: There is no significant difference between the mean scores of the students taught biology using field trip method and those taught using lecture method.

Ho_2: There is no significant difference in the mean scores of male and female students taught biology using field trip method.

1Presentation of Results/ Findings

Research Question 1: What is the effect of field-trip and lecture method on students' academic achievement in biology?

Table 2: MEAN ACHIEVEMENT SCORES OF STUDENTS TAUGHT BIOLOGY USING FIELD-TRIP AND LECTURE METHOD.

Group	No. of students	Mean scores		Standard deviation	Mean gain
		Pre-test	Post-test		
Experimental	50	20.36	37.84	1.50	17.48
Control	50	19.2	22.48	2.22	3.28
Mean Difference		1.16	15.36		14.2
Total	100				

Table 2 shows that the mean achievement scores of students taught biology using field-trp approach is 20.36 at the pretest stage. But their mean achievement score at the post test stage is 37.84 with a standard deviation of 1.50. While the students taught biology using conventional lecture method has mean achievement score of 19.2 at the pretest stage. But at the post test stage, their mean achievement score is 22.48 with a standard deviation of 2.22. This by implication shows that, mean scores gain by students taught biology using field trip approach was 17.48 while those taught biology using the conventional lecture method was 3.28. Thus, those taught with field-trip performed better.

Research Question 2: what is the difference in the mean achievement scores of male and female students taught biology using field-trip?

Table 3: MEAN ACHIEVEMENT SCORE OF MALE AND FEMALE STUDENTS TAUGHT BIOLOGY USING FIELD TRIP

Group	No .of students	Mean scores		Standard deviation	Mean gain
		Pre-test	Post-test		
Male	22	18.33	34.18	2.38	15.85
Female	28	20.82	37.5	1.77	16.68
Mean Difference		2.49	3.32		
Total	50				

Table 3 shows that for the experimental group, the mean achievement scores of male students at both pretest and posttest stages are 18.33 and 34.18 respectively while those of the female are 20.82 and 37.5 respectively. The analysis reveals that the mean achievement score of female experimental students is higher than that of the male experimental students.

This implies that the posttest mean achievement of female students is slightly higher than the male students. Thus, female performs better than male when field trip approach is used.

Hypothesis one: There is no significant difference between the mean achievement score of students taught biology using field trip and those taught with conventional lecture methods.

Table 4: ANALYSIS OF COVARIANCE OF THE EFFECT OF FIELD TRIP METHOD ON THE STUDENTS' ACHIEVEMENT IN BIOLOGY

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	6566.237	4	1641.559	19.642	.000
Intercept	25766.759	1	25766.759	308.312	.000
Pretest	2079.363	1	2079.363	24.881	.000
Treatment	3925.154	1	3925.154	46.966	.000
Sex	16.080	1	16.080	.192	.661
Treatment * Sex	3.204	1	3.204	.038	.845
Error	18636.904	223	83.574		
Total	767572.000	228			
Corrected Total	25203.140	227			

The analysis of data in Table 4 shows that the probability value associated with the calculated value of F (46.966) for the effect of method on the achievement of students in biology is 0.000. Since this value (0.000) is less than the 0.05 level of significance, the null hypothesis is not retained. Hence there is a significant difference in the mean achievement scores of students taught biology using field trip approach with mean score of 37.84 and those taught using conventional lecture method with mean score of 22.48 which was in favour of the students taught biology using field trip approach

Hypothesis 2: There is no significant difference between the mean achievement score of male and female students taught biology using field trip method.

Table 5: ANALYSIS OF COVARIANCE FOR THE EFFECT OF FIELD TRIP METHOD ON MALE AND FEMALE STUDENTS IN BIOLOGY

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	6566.237	4	1641.559	19.642	.000
Intercept	25766.759	1	25766.759	308.312	.000
Pretest	2079.363	1	2079.363	24.881	.000
Treatment	3925.154	1	3925.154	46.966	.000
Sex Gender	16.080	1	16.080	.192	.661
Treatment * Sex	3.204	1	3.204	.038	.845
Error	18636.904	223	83.574		
Total	767572.000	228			
Corrected Total	25203.140	227			

The analysis in Table 5 was done to test hypotheses 2, the analysis of Table 6 shows that the probability value associated with the calculate value of F (0.192) for the effect of gender on students' achievement is 0.661. Since this value is greater than 0.05 level of significance, the null hypothesis was accepted. Thus, there is no significant difference between the mean achievement score of male and female students taught biology using field trip method and

conventional lecture method. Though, the female students perform slightly better than the male.

Discussion of the Results

This study is very significant in the sense that it has been able to demonstrate the usefulness of field trip in the learning of biology particularly ecology concept. The most important usefulness of field trip lies in the basic facts that they provided most realistic means of meeting organisms in their actual environment. This makes topics or concepts and principles taught more vivid and retention better.

Table 4 proved that there was significant difference between mean score of the experimental and control groups. This suggested that the field trip teaching strategy has favoured the experimental groups. This confirmed the findings of Ajaja (2010) and Michie (2017) which stated that knowledge gains were found to be significant with the experimental group using field trip teaching strategy more than their counter part that were strictly taught in the class using lecture method.

In Table 5, the study revealed that female students perform slightly better than the male students but this difference is not significant. This result is in agreement with the findings of Martha and Tubonemi (2021) who find out in their research that there is no significant difference in the achievement of male and female students who were taught biology using field trip.

Conclusion

Generally, it was confirmed that there was high significant difference between the mean achievement of the experimental and control groups. This further confirmed that the field trip teaching strategy has gained more than the traditional method of teaching. Field trip teaching strategy favored the experimental groups was due to the fact that the pre-requisite steps of activities in teaching of biology concept were followed. This has stimulated students' attention and interest, which led to good performance in biology. The students on experimental group were taught with the strategy (field trip) that required the used of basic science process skills such as observation, identification, classification and manipulation of substances in the natural surroundings. The students in this group became more active and creative since they can see and manipulate organism in their natural surroundings.

Recommendations

Based on the findings of this study; the following recommendations are made; thus:

(i) Although field trip is integrated into the teaching programme, it is not being used. Therefore, the government should make the use of field trip teaching strategy compulsory particularly in the teaching and learning of the ecology concept at SS level. This will enhance students gain first hand information, and provide opportunity for them to see, possibly touch and feel what they have heard about certain organism and situations.

(ii) Field trip experiences should emphasizes real practical experiences with the students collecting, analyzing data, interpreting data and using them to explain previous knowledge.

(iii) Field trip when used should be such that can serve as an integrated learning i.e field trip cannot teach one idea, but many. A field trip to a vegetable farm, for example can bring disparate topics together such as photosynthesis, the scientific method, how to collect data, plant, insect, part of flowers, soil erosion etc.

(iv) For the exercise (field trip) to be successful, it has to be well-funded, by both school authorities and parents. As such the school authorities and parents should put hands together to make field trip teaching strategy at all level of learning in successful one by proper funding at any design time.

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