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Effect Of Fieldtrip Strategy on Academic Achievement of Senior Secondary School Biology Students in Ekiti Local Government Area of Kwara State, Nigeria

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Abstract

This study examined the effects of field trip strategies on biology students' academic performance. The quasi-experimental pretest-posttest control group design was used in this study. Eighty SSII Biology students from two (2) coeducational schools in Kwara State's Ekiti Local Government Areas made up the treatment group. The Biology Student Achievement Test (r=0.86) and the instructors' instructional manuals on field trip planning were utilized. Two research questions and hypotheses served as the inquiry's compass. analysis of covariance, and descriptive statistics were utilised to analyse the data level of 0.05. The study found that the field trip strategy fared better than the traditional approach in raising students' biology ability. When comparing biology students taught using the standard technique with those exposed to the fieldtrip approach, there is a significant difference in the mean achievement score. The mean achievement scores of male and female biology students exposed to the fieldtrip technique did not differ significantly from those of their counterparts taught using the conventional approach. The results suggest that biology professors should employ a field trip approach to help students study more effectively since it may raise students' self-esteem and performance.

Keywords: Fieldtrip strategy, Achievement, Biology and Students

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Introduction

As a scientific subject and a prerequisite for many other subjects, biology has a special place in the senior optional school training programme. This is justified by the way biology conducts research on living things and how it relates to the existence of humans. Biology is the study of physiology, organic chemistry, living structures, frameworks, genetic traits, development, and nature of plants and animals. These fields of study have a significant impact on Nigeria's and the world's logical progress. Biology plays a crucial role in every aspect of life and permeates every aspect of our world, supporting human existence in a variety of ways. It aids in increasing food production, battling illnesses, and protecting and rationing our existing situation.The advances in the area of biology have brought about exclusive expectation of living in the field of food and wellbeing areas. Creation of plants has expanded by further developing the assortments in light of high return, dry spell safe and sicknesses safe assortments of plants and creatures that are utilized as food. Biology is a significant field since any remaining fields of study are subject to the realities that are uncovered by the examinations that are done in area of biology. Oluwole and Muraina (2016) revealed that biology is the science of life. Moreover, Ogundiwin (2013) focused on the significance of Biology in wellbeing area, natural resources management, food supply and others.

The particular goals to be accomplished by Biology educational program, as expressed in the Public Strategy on Schooling (Muraina, 2016), incorporate, among others; to understand specific key natural ideas fundamental for fruitful living and to enlighten the issues propagation, development, contamination, wellbeing and to dispel strange notions convictions. Accessible measurements from West Africa Examinations Council (WAEC) (2011-2019; 2011-2019) Chief Examiner’s Reports on senior optional school understudy's presentation in biology uncovered an exceptionally poor and inconsistence execution at Senior secondary school (SSS) students' performance. Ogundiwin (2013) upholds this and Muraina et al. (2021) who communicated that Nigerian students continue to do poorly in biology, especially on open tests. The extent of this problem was demonstrated by a review of the Senior Secondary Certificate Examination (SSCE) Results in Table 1, which is available from the WAEC Measurements Unit. This unit examined student enrollment and biology presentations. Table 1 shows the percentage distribution of students' biology performance in Nigeria's May/June Senior Secondary Certificate (SSCE) from 2010 to 2019.

Table 1. ***Nigerian Students' May/June Senior Secondary Certificate (SSCE) Biology Performance Distribution, Percentage, 2010-2019***

Year	Total no of students for the examinassions	Total no of credit passes	% CreditA1-C6	% Failure
2010	1,300,418	427,644	33.90	66.06
2011	1,505,199	579,432	38.50	61.50
2012	1,672,224	649,156	38.81	61.20
2013	1,646,741	850,772	51.66	48.34
2014	1,356,243	511,956	29.34	70.66
2015	1,145,228	371,628	24.39	75.61
20-16	1,200,367	740,345	61.68	36.32
2017	580,449	394,299	68.03	30.92
2018	1,087,063	678,299	62.48	35.52
2019	1,033,304	775,103	75.01	23.93

Sources: Statistics Section, WAEC National Head Office, Yaba Lagos, 2020 Nigeria

The table 1 showed the level of credit passes and failures from year 2010 to 2019. In year 2013 and 2016 to 2019, great academic achievement was maintained, in which the rate credit passes bounced from 38.81% to 75.01% and the rate failure dropped from 61.20% to 23.93%. In any case, ensuing years (after 2013) , the level of passes definitely diminishing from 51.66% to 24.39% , while the level of failure was expanded from 48.34% to 75.61% .The students' performances were conflicting in the years viable. For instance, in Year 2016, 61.68% of students passed at credit level. In Year 2017, it bounced up to 68.03% yet dropped to 62.48% in Year 2018. Year 2019 understudy make high improvement with 775,103 students out of 1,033,304 which is 75.01% passing at credit level.

The drop and conflicting in the level of acknowledge passes might be because of changed in the subject status from obligatory to elective for secondary school students (FRN, 2013). The rate passes for the year 2010 to 2012 and 2014 to 2015 were not adequate particularly for most candidates that might have included Biology as one of the subjects required for admission into higher institutions. This was upheld by Ogundiwin (2013) and Muraina et al. (2021) who thought that students' presentation in biology is poor regardless of a few vital endeavors that have consistently been made over the course of the years to cure the yearly terrible showings. In particular, in WAEC (2014) Chief Examiner's report uncovered candidates' mass failure in WAEC May/June examination.

Honestly speaking, achievement should be enhanced on the students through showing utilizing suitable informative methodologies. Among the methodologies that have been recently utilized are; Experiential strategy by Muraina et al. (2021),Request strategy by Laksama (2017), Basic investigation strategy by Adewumi (2014); Oluwole and Muraina (2016), Baffled Based Decisive Reasoning Inspiration Systems by Ogundiwin (2013).Despite the abundance of strategies available, students demonstrated a low level of performance on the SSS Certificate examinations, as indicated by Table 1.

Literature Review

The poor performance of students in biology is being attributed to the unreliable methods of instruction that the majority of biology professors use. Experts have found that the instructor-focused approach that teachers typically adopt doesn't enable the students to actively benefit from knowledge that might raise their accomplishment (Muraina, 2016; Muraina et al., 2021). In order to address the deficiencies, researchers (Adewumi and Adeoye, 2023; Ibitoye, 2021; Muraina, 2016;Ogundiwin, 2013) have subsequently suggested using dynamic learning systems. The investigation works of (Musa et al., 2018; Oloidi and Adeyemi, 2020; Sunday, 2021) suggest using field trips to work on biology learning in order to combat the situation.

A field trip is an outside or field work that teachers and students participate in together in particular subject areas to provide students the opportunity to study. It might also be described as field trips to various locations in order to obtain accurate information by witnessing things as they actually are (Muraina, 2016). According to Shakil, and Hafeez (2011), instructional field excursions are a constantly developing advancement strategy in which the instructor takes the lead and provides the understudy with significant prospects for personal development. According to Oka and Samuel (2020), a field trip is an expedition or excursion that takes place outside of the classroom with the specific goal of obtaining explicit data and firsthand observations. Individual encounters with species in their usual environments are enhanced by a biology-showing strategy (Zumyil, 2016). It helps kids develop their entire character, including their mental, physical, social, and deep turns of events. Students get the opportunity to see the globe and get firsthand experiences through educational field trips. It also facilitates in cooperative learning.

According to Zumyil (2016), well-planned field visits enable students

to participate actively in observing, gathering, organising, analysing relationships, and managing objects. They also help students get a deeper comprehension of certain concepts and events. According to the majority of exams, young women often perform better academically than young males (Adewumi and Adeoye, 2023). The study of Yuniskurin, et al. (2019) also demonstrates that females performed better than males in spelling test, proficiency tests, writing assignments, and general knowledge tests. On the other hand, Muraina, et al. (2021) and Muraina (2016) shown that women's under addressed status and levels of accomplishment in the disciplines of their degrees of achievement in the fields of sciences and innovation where low contrasted with the people.

Sunday (2021) found that the experimental group was able to teach and understand the biological concept of ecology with the use of the field-trip teaching approach. Njoku and Mgbomo (2021) found that the field trip mode of instruction increased biology students' performance more than the demonstration technique. Muraina, et al. (2021) who discovered no discernible difference in the mean performance scores of pre-service male and female biology teachers employing a peer-collaborative learning approach. This study also refutes the findings of Ogbu et al. (2023), who said that using the group algebraic blocks approach, female students showed more interest in mathematics than male students. The study concludes that since the fieldtrip approach gives students of both genders nearly equal opportunities to learn and achieve, it is gender friendly.

Many investigations had been done on comparative point both at the public and worldwide levels, zeroing in on the utilization of educational techniques to work on students' achievement. Works have been done on the strategy and orientation independently on various subjects. In any case, not much has been finished involving the strategy and orientation in the space of skeleton in Biology. It is this gap that this study stands to fill. This studyseeks to figure out the impacts of that fieldtrip strategy will have on students Achievement on idea of skeleton in Biology. It additionally, analyzed the impact of students' gender on the idea of skeleton in biology.

Statement of the Problem

However significant as Biology may be to vocation compatible in sciences courses, it is discouraging that achievement of students in the subject at the SSS level is turning out to be more disappointing than in different subjects especially in Kwara State. In fact, the students' learning results have not been encouraging. Researchers have demonstrated the requirement for the reception of active teaching and learning educational

techniques to address this inadequacy (Muraina, et al., 2021; Ogundiwin, 2013). By the utilization of this new and dynamic strategy, they have likewise proposed that the degree of progress in biology schooling by students will likewise move along. Writings have reported the viability of fieldtrip strategy in upgrading students' learning results in Physical science and Science disregarding their impacts on students' achievement in Biology. The strategy has additionally been utilized for the improvement of students' scores in the English language. This study, hence, resolved the impacts of field trips on the academic achievement of students in Biology in Ekiti Local Government Area of Kwara State. The moderating impact of gender was likewise examined.

Purpose of the Study

This study set out to find out how field trip strategies affected Kwara State biology students' academic performance. In particular, the research aimed to:

1. Compare the mean accomplishment scores of the students who were exposed to the field trip strategy in biology with those of the students who were taught using the traditional technique.
2. Compare the mean accomplishment scores of students exposed to fieldtrip strategies with those of their counterparts taught using conventional strategies, looking for differences in mean scores.

Research Questions

Following research questions were formulated for this study.

1. How does the mean score of students who were exposed to the biology fieldtrip strategy differ from those of their peers who were taught using the standard technique?
2. When comparing the mean accomplishment scores of biology students exposed to fieldtrip strategies with those of their counterparts taught using conventional strategies, what is the difference?

Hypotheses

To guide the investigation, two null hypotheses were developed and evaluated at the 0.05 level of significance.

$H0_1$: There is no significant difference in the mean accomplishment score of students exposed to fieldtrip approach in biology when compared to their counterparts taught utilising conventional technique.
$H0_2$: There is no significant difference in mean accomplishment scores between students exposed to the fieldtrip approach in biology and their

counterparts who were taught using the traditional technique.

Methodology

The quasi-experimental research design was used in this study. It had two groups: experimental and control groups selected from the population of senior secondary class two (SSII) in Ekiti Local Government Area, Kwara State. The experimental group thought skeletons using a fieldtrip technique, whereas the control group thought skeletons using the lecture method. The research's population comprises of 920 senior high school year two students from ten (10) public schools located in the study region. The study's sample consisted of eighty (80) SSII students, 36 of whom were male and 44 female. The study's sample was selected using a simple random sampling procedure. The research included two (2) schools from a total of ten (10) schools. As a result, one entire class was chosen from each of these institutions. The two schools with intact classes were sorted and randomly allocated to two groups: experimental and control. The experimental group was exposed to the fieldtrip technique, whereas the control group was subjected to the lecture method**.**

The study's instrument was the Biology Students Achievement Test (BSAT), which the researcher developed. The instrument is divided into two sections: Section A and Section B. Section A contains students' bio-data information, while Section B has fifteen (15) items and a four (4) option multiple choice exam. One secondary school biology teacher who is a seasonal WAEC/NECO examiner, as well as two university academics, one from the department of scientific education and one from the department of test and measurement verified the instrument. The researcher's pretest and posttest marking systems, as well as the lecture notes for both the experimental and control groups, were evaluated for face validity and applicability to the two groups. The achievement test (BSAT) was pilot – tested to establish its reliability. A reliability index of r = 0.86was obtained.

The biology achievement exam was given to students in both groups. To analyse the collected data, a mix of inferential and descriptive statistics was employed. Descriptive and inferential statistics, together with Analysis of Covariance (ANCOVA) at the 0.05 level of significance, were used to analyse the research hypotheses.

Results

Research Question one (1): What is the difference between the achievements mean score of the students exposed fieldtrip strategy in biology and compare with their counterpart taught using conventional strategy?

Table 2. ***Characteristic Statistics of Treatment-Associated Achievement***

Treatment	N	Pre-test		Post-test		Means
		X1	SD1	X2	SD2	Difference
Fieldtrip strategy	34	44.57	10.64	57.68	11.63	+13.52
Lecture method	46	44.94	11.39	51.72	11.76	+6.78

Table 2 shows the descriptive statistics of accomplishment associated with treatment scores for students exposed to fieldtrips vs their counterparts taught utilising the lecture approach. The results showed that before the treatment, biology students in the fieldtrip group had a performance mean score of (44.57), whereas the lecture method teaching group had a performance mean score of (44.94), with a mean difference of (0.37), which is negligible. Their measure of variability differed by 0.75. After the treatment, students who went on a field trip had a performance mean score of (57.68), whereas the lecture style teaching group had a performance mean score of (51.72), with a mean difference of (5.96), which is minor. Their measure of variability differed by 0.13. The results showed that the average gain for the students.The result revealed that the mean gain for the students in the experimental group (13.52) was greater than the mean gain (6.78) of those in the control group. This implies that student expose to field trip methods did better than those to expose to lecture method.

Research Question Two: What is the difference between the mean achievement scores of male and female students exposed to fieldtrip strategy in biology and compare with their counterpart taught using conventional strategy?

Table 3. ***Descriptive Statistics of Gender-Associated Achievement Scores***

Gender	**N**	**Pre-test**		**Post-test**		**Means**
		Mean	SD	Mean	SD	Difference
Male	36	31.29	6.35	36.52	6.48	6.23
Female	44	31.48	5.03	36.40	5.89	5.92

Table 3 shows that male students in fieldtrip strategy class gained an average of 6.23, while female students gained 5.92, with a mean difference of 0.31 in favour of male students. This suggests that male students learned more in fieldtrip class than female students. As a result, the fieldtrip technique helped male students achieve higher than female students in the same class. As a result, the fieldtrip technique improved male students' biology scores more than female students'.

Hypotheses Testing

$H_0$1: There is no significant difference between the achievements mean score of the students exposed to fieldtrip strategy in biology and compare with their counterpart taught using conventional strategy.

Table 4. ***Post-Achievement Analysis of Covariance (ANCOVA) by Treatment and Gender***

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1122.082	2	5613.041	130.471	0.001	0.209
Intercept	1411.176	1	1411.176	168.536	0.000	0.353
Pre-Test BSAT	79.460	1	79.460	27.27	0.003	0.008
Treatment	2110.624	1	2110.624	49.060	0.000*	0.095
Gender	53.919	2	26.960	0.925	0.397	0.006
Error	9731.200	74	29.135			
Total	113511.000	78				
Corrected Total	12298.820	76				

R S R Squared = 0.729 (Adjusted R Squared = 0.723) * denotes significant $p<0.05$

The findings of the analysis of covariance (ANCOVA) performed to evaluate hypothesis one are shown in Table 4. The table demonstrates that the calculated significance of (0.000) was obtained from the computed F value (49.06) at (1.99) degree of freedom, which is less than the alpha threshold of 0.05 ($p<0.05$). As a result, the alternative hypothesis is accepted and the null hypothesis is rejected, suggesting that students who were educated through lectures and those who went on field excursions scored significantly differently on the post-test.

H02: There is no significant difference between the mean achievement scores of students exposed to fieldtrip strategy in biology and compare with their counterpart taught using lecture method.

The mean performance scores of male and female biology students taught using the fieldtrip approach do not significantly differ ($F(1, 76) = 0.925$; $p = 0.397 < 0.05$), as Table 4 demonstrates. This indicates that the null hypothesis is not rejected, and it is shown that students taught using the fieldtrip approach do not significantly vary in their mean achievement ratings.

Discussion

The results of this study revealed that when it came to the biological issue (skeleton), students in the experimental group (field trip strategy) outperformed their control group (lecture method). This illustrates how the students' exposure to a field trip as a teaching method enhanced their understanding of the biological notion of skeleton. The results are in line

with Sunday's (2021) assessment of the impact of field trips on secondary school students' scholastic achievement in ecological concepts in the Zaria Local Government Area of Kaduna State, Nigeria. Sunday (2021) found that the experimental group was able to teach and understand the biological concept of ecology with the use of the field-trip teaching approach. Njoku and Mgbomo (2021) found that the field trip mode of instruction increased biology students' performance more than the demonstration technique.

The results of the study also showed that male biology students in the same class performed better after using the fieldtrip approach than female students did. Nonetheless, there was no discernible variation in the average achievement levels between male and female students who received integrated scientific instruction using field trips. This finding is in line with that of Muraina, et al. (2021) who discovered no discernible difference in the mean performance scores of pre-service male and female biology teachers employing a peer-collaborative learning approach. This study also refutes the findings of Ogbu et al. (2023), who said that using the group algebraic blocks approach, female students showed more interest in mathematics than male students. The study concludes that since the fieldtrip approach gives students of both genders nearly equal opportunities to learn and achieve, it is gender friendly.

Conclusion

The results of this study have demonstrated that the field trip approach is more effective than the lecture technique in raising students' biological achievement. Furthermore, the gender-friendly nature of the field trip method demonstrated its non-discriminatory nature by raising student accomplishment on par with that of both male and female students.

Recommendations

The outcome of this study prompted the accompanying suggestions being made:

1. Teachers of biology in SSS in Nigeria ought to be encouraged to use field trips as a means of teaching the subject.
2. In order to raise their students' performance in biology, biology teachers should adopt the cutting-edge field trip approach. The field trip approach is also gender-friendly.
3. Biology professors should routinely organise seminars and workshops where the many procedures required in a field trip would be discussed.

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