

## ENHANCING STUDENTS' INTEREST AND ACHIEVEMENT IN SENIOR SECONDARY SCHOOL BIOLOGY THROUGH FIELD TRIP TEACHING APPROACH

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### Abstract

*This study investigated on how the use of field-trip teaching approach could affect students' interest and academic achievement in Biology. The sample size of the study consisted of 100 SSS1 biology students from two secondary schools randomly selected out of 31 secondary schools in Nsukka Local Government Area. Four research questions and null hypotheses guided the study. Quasi-experimental design was adopted for the study. Specifically, the non-equivalent control group design. The instrument used to collect data was Biology Achievement Test (BAT) and Biology Interest Scale (BIS). The BAT and BIS were validated and trial-tested and found to have an internal consistency reliability of 0.82 and 0.87 respectively. The research questions were analyzed using mean and standard deviation while Analysis of Covariance (ANCOVA) was used to test for the hypotheses at 0.05 level of significance. The results revealed that field-trip approach significantly improved students' achievement and interest in biology. Although female students performed better than their male counterparts, there is no significant influence of gender on students' achievement in Biology. Male students gained more interest than the female students but there is no significant influence of gender on students' interest in Biology. It was recommended among others that biology teachers should be trained on how best to involve students during field trip so as to facilitate the interest and achievement of students in lesson.*

**Keywords:** Biology, achievement, interest, field trip approach, gender.

### Introduction

Biology plays a vital role in the economic development of a nation. Biology as a science of life is concerned with the characteristics of living things, their forms, functions and relationship with one another and with their environment. It is an interesting subject that has been intriguing scientific minds for several centuries. Despite exponential developments in technology over the past few centuries, the origin of life on earth is still one of the biggest mysteries yet to be unraveled. The basis of our very origin and existence on earth lies within the depths of the biological sciences. Biology occupies a unique position in the school curriculum and it is one of the science subjects required in many science-related courses such as medicine and surgery, nursing, pharmacy, biochemistry. The biology curriculum just like any other science, is activity oriented and student-centered. According to FME (2014), the objectives of biology curriculum includes the preparation of students to acquire adequate laboratory and field skills in biology among others. In the pursuance of the stated objectives, emphasis is laid more on teaching and learning of biology as a process rather than a body of knowledge. However, today, the Nigerian teachers have deviated from the stated objectives, rather than teaching biology in the natural settings, the talk and chalk approach (conventional approach) to teaching has become a phenomenon in most schools in Nigeria.

The conventional approach to teaching is where the teacher does the talking while the students are passive in the learning process. Their duties only include listening and answering questions from the teacher. This has not augured well with the Nigerian school-child as there has been a large report of student lack of interest and poor achievement in external examination (WAEC Examiner's report, 2020). In most Secondary Schools, both students and teachers of sciences in particular biology complain of difficulties in getting on with the subjects, mostly those topics involving practical or hands-on activity. Students claim that the subject or probably the topic is very vast and often they do not cover much before they write their examinations. Kristina & Pavol (2016) stated that teaching has been removed from its natural environment (nature) to an artificial environment (a school class). According to them, this affects students' interest and achievement in biology.

Achievement can be regarded as a change in behaviour exhibited at the end of a given period of time or within a given time range. According to Aniaku (2013), academic achievement is the accomplishment of educational goal, educational outcome of students or the extent to which a teacher or instructor has achieved the stated educational objectives. Hence achievement could be described as a task which has been accomplished successfully, especially by means of exertion, skill practice or perseverance. Adebayo (2011) opined that the low achievement rate of students in biology in West African Senior Secondary School Certificate Examination (WASSCE) is a reflection of the disconnection between teacher and their students, hence the need for a new approach to bridge the gap in classroom learning. The West African Examination Council (WAEC) Chief Examiner's report 2020 noted that the persistent poor achievement of students in biology at Senior School Certificate Examination (S.S.C.E) leaves one in doubt about the effectiveness of instructional methods used by the biology teachers for the teaching and learning of biology. The low achievement of biology student is an indication that it is either biology teachers do not utilize student-centered approaches to teach, or that there are other factors which possibly affect achievement. Some of these factors put forward by researchers as potentially impacting achievement include; method of teaching, attitudinal problems of students, cognitive, socio-economic problems of teachers and interest.

Interest can be regarded as a feeling that accompanies or causes special attention to something or someone. According to McGrew (2017) interest is a person's relatively stable or enduring predisposition, positive affective orientation, and tendency to persevere when working on certain specific academic content or task domains. Thus, academic interests should not only be considered important facilitators of academic outcomes, but also as valued educational outcomes in their own right (Eccles & Wigfield, 2012). Therefore if students' academic achievement and interest in biology is to be improved, there is need for biology teachers to explore other instructional strategies such as field trip approach to ensure the successful transition of biology curriculum objectives and bridge the gap in classroom learning.

Field-trip approach is an approach that involves taking the students on an excursion outside the classroom for the purpose of making relevant observation necessary for understanding of the topic under study. According to Ekpo & Ehi, (2022) field trip approach refers to a study trip taken outside the classroom to obtain direct experience of a natural environment. Using field trip approach enhances teacher-student interaction outside the classroom and these interactions take place in new learning environment and result in a meaningful teaching and

learning process. Field trips are rich in educational possibilities as students learn from actual hands-on experience rather than by simply reading or hearing about something. The key to success in teaching biology is not just providing students with a science immersion experience, but also enabling them to conceptualize biology as a creative process of thinking other than a defined body of knowledge. Field trip offer students firsthand experience since they see and observe processes in natural life settings. Field trip enables students to discover and explore new information and also apply previous knowledge by giving concrete examples. Field trips when appropriately utilized in teaching and learning of biology makes leaning more concrete, real, immediate and permanent (Achiemugu, 2016). However, to achieve maximum benefit from this teaching approach, it is very important for the teacher to ensure proper planning and implementation. Field trips are interactive teaching approach which could give both male and female students equal opportunity to widen their practical and cultural experience by varying their learning environments.

Gender has been described as a cultural construct and social positions which members of the society attach to being male or female. According to Okeke (2017) gender is a social or cultural determinant that varies from place to place or culture to culture. It is not universal, unlike sex which is biologically determined and universal. Macionis and Genber (2015) observed that throughout life, human feelings, thought and actions reflect the social definitions that people attach to gender which affects the way the individual's daily activities may either be positively or negatively influenced. As gender affects the way people think of themselves, it teaches them to act in normative ways, that is acting and feeling in the manner that the society ascribed to each sex. However, no evidence of superiority is expected to be noticed in the academic performance based on gender, if both males and females are exposed to learning experiences equally (Amosa, 2013). The use of field trip approach to teaching and learning might give both male and female students equal opportunity to widen their practical and cultural experience by varying their learning environments. The present study was designed to determine the effects of field trip on male and female students' achievement and interest in biology.

### **Purpose of the Study**

The general purpose of this study is to determine the effects of field trip approach on students' interest and achievement in Biology. Specifically, the study seeks to determine the;

1. effects of field trips approach and conventional approach on students' achievement in Biology
2. effects of field trips approach and conventional approach on biology students' interest in Biology
3. influence of gender on the students' achievement in Biology
4. influence of gender on the students' interest in Biology

### **Research Questions**

The following research questions will guide the study,

1. What is the effect of field trip approach and conventional approach on students' mean achievement score in Biology?
2. What is the effect of field trips approach and conventional approach on biology students' mean interest score in Biology?
3. What is the influence of gender on the students' mean achievement score in Biology?
4. What is the influence of gender on the students' mean interest score in Biology?

## Hypotheses

The following null hypotheses were tested:

1. There is no significant difference in the mean achievement scores of students taught Biology using field trip approach and conventional approach.
2. There is no significant difference in the mean interest scores of students' taught Biology using field trip approach and conventional approach.
3. There is no significant difference in the influence of gender on students' mean achievement score in Biology.
4. There is no significant difference in the influence of gender on students' mean interest score in Biology

## METHODS

The design of the study is quasi-experimental design was adopted for the study. Specifically, the non-equivalent control group design. The population of the study comprised of all the senior secondary class one in the 31 secondary schools in Nsukka Local Government Area who are offering biology. The sample size of the study consisted of 100 senior secondary school 1 biology students from two secondary schools randomly selected. Four research questions and null hypotheses guided the study. The instrument used to collect data was Biology Achievement Test (BAT) and Biology Interest Scale (BIS). Two experts in measurement and evaluation and one from biology education validated the instrument. The instrument was trial-tested by biology students for BAT and fourteen for BIS and found to have an internal consistency reliability of 0.82 and 0.87 respectively. The data obtained from trial-testing was used to determine the reliability of the instrument using Kuder-Richardson 20. The experimental group was taught using field trip approach while the control group was taught using conventional approach. The treatment lasted for four weeks. The research questions were analyzed using mean and standard deviation while Analysis of Covariance (ANCOVA) was used to test for the hypotheses at 0.05 level of significance.

## RESULTS

### Research Question One

**Table 1: Mean and Standard Deviation Achievement Scores of Students taught Biology using Field trip approach and those taught using conventional approach**

| Teaching Method                     | N  | Pre-test  |      | Post-test |      | Mean Diff. |
|-------------------------------------|----|-----------|------|-----------|------|------------|
|                                     |    | $\bar{x}$ | SD   | $\bar{x}$ | SD   |            |
| <b>Field trip teaching approach</b> | 50 | 12.77     | 3.54 | 22.94     | 2.93 | 10.17      |
| <b>conventional approach</b>        | 50 | 12.92     | 4.57 | 18.22     | 7.45 | 5.30       |

From Table 1, the post-test mean and standard deviation score for students taught Biology using field trip teaching approach are 22.94 and 2.93 while the post-test mean and standard deviation scores for those taught using conventional approach are 18.22 and 7.45. The mean difference in the post-test score revealed that the students taught with field trip teaching approach achieved higher than those taught with conventional approach.

### Hypothesis One

**Table 2: ANCOVA showing Significant Difference in the Mean Achievement of Students taught Biology using Field trip teaching approach and those taught using conventional approach.**

| Source            | Type III Sum of Squares | Df  | Mean Square | F       | Sig. | Partial Eta Squared |
|-------------------|-------------------------|-----|-------------|---------|------|---------------------|
| Corrected Model   | 559.720 <sup>a</sup>    | 2   | 279.860     | 8.672   | .000 | .152                |
| Intercept         | 3383.040                | 1   | 3383.040    | 104.833 | .000 | .519                |
| Pre-Achiv. Score  | 16.149                  | 1   | 16.149      | .500    | .481 | .005                |
| Teaching-Approach | 546.852                 | 1   | 546.852     | 16.946  | .001 | .149                |
| Error             | 3130.277                | 97  | 32.271      |         |      |                     |
| Total             | 46161.015               | 100 |             |         |      |                     |
| Corrected Total   | 3689.996                | 99  |             |         |      |                     |

Table 2 shows F-ratio of 16.946 with associated probability (Sig.) of 0.001 and effect size of .149 under Teaching-Approach. The associated probability level is less than the 0.05 level of significance stated for testing of the null hypothesis. Therefore, the null hypothesis is rejected, which implies that there is a significant difference in the mean achievement scores of students taught Biology using field trip teaching approach and those taught using conventional approach, in favour of the group taught using field trip teaching approach.

### Research Question Two

**Table 3: Pre-test and Post-test Mean and Standard Deviation Interest Scores of Biology students' taught Biology using Field trip teaching approach and those taught Using conventional approach**

| Teaching Method              | N  | Pre-test  |      | Post-test |      | Mean Diff. |
|------------------------------|----|-----------|------|-----------|------|------------|
|                              |    | $\bar{x}$ | SD   | $\bar{x}$ | SD   |            |
| Field trip teaching approach | 50 | 31.52     | 5.39 | 47.07     | 4.55 | 15.55      |
| conventional approach        | 50 | 33.65     | 4.98 | 40.71     | 7.71 | 7.06       |

Table 3 shows that the post-test mean and standard deviation interest scores for the students taught using field trip teaching approach are 47.07 and 4.55 while post-test interest mean and standard deviation scores of those taught with conventional approach are 40.71 and 7.71 respectively. The differences in the mean post-test interest scores revealed that students taught with field trip teaching approach developed greater interest in Biology than their counterparts taught with conventional approach

## Hypothesis Two

**Table 4: An ANCOVA showing Significant Difference in the Mean Interest Scores of Biology Students Biology using Field trip teaching approach and those taught Using conventional approach**

| Source            | Type III Sum of Squares | df  | Mean Square | F       | Sig. | Partial Eta Squared |
|-------------------|-------------------------|-----|-------------|---------|------|---------------------|
| Corrected Model   | 1011.246 <sup>a</sup>   | 2   | 505.623     | 12.495  | .000 | .205                |
| Intercept         | 4847.158                | 1   | 4847.158    | 119.785 | .000 | .553                |
| Pre-interest      | 1.616                   | 1   | 1.616       | .040    | .842 | .000                |
| Teaching-Approach | 951.864                 | 1   | 951.864     | 23.523  | .001 | .195                |
| Error             | 3925.151                | 97  | 40.465      |         |      |                     |
| Total             | 197564.107              | 100 |             |         |      |                     |
| Corrected Total   | 4936.397                | 99  |             |         |      |                     |

Table 4 shows F-ratio of 23.523 with associated probability (Sig.) of .001 and effect size of .195 under Teaching-Approach. The associated probability level is less than the 0.05 level of significance stated for testing of the null hypothesis. Therefore, the null hypothesis is rejected, which implies that there is a significant difference in the mean interest scores of Biology students taught Biology using field trip teaching approach and conventional approach in favour of students taught using field trip teaching approach. The high effect size value supports that there is a significant difference between the two groups.

## Research Question Three

**Table 5: Mean and Standard Deviation Achievement Scores of Students taught Biology using Field trip teaching approach and those taught using conventional approach**

| Gender | N  | Pre-test  |      | Post-test |      | Mean Diff. |
|--------|----|-----------|------|-----------|------|------------|
|        |    | $\bar{x}$ | SD   | $\bar{x}$ | SD   |            |
| Male   | 45 | 13.20     | 4.81 | 20.51     | 6.34 | 7.31       |
| Female | 55 | 12.55     | 3.37 | 20.61     | 6.11 | 8.08       |

Table 5 shows that the post-test mean and standard deviation achievement scores for the male students are 20.51 and 6.34 while that of the female students are 20.61 and 6.11 respectively. The differences in the mean post-test achievement scores revealed that female students outperformed their male counterparts.

### Hypothesis Three

**Table 6: An ANCOVA showing No Significant Difference in the Mean Achievement Scores of Male and Female Students Biology using Field trip teaching approach and those taught using conventional approach**

| Source          | Type III Sum of Squares | df  | Mean Square | F      | Sig. | Partial Eta Squared |
|-----------------|-------------------------|-----|-------------|--------|------|---------------------|
| Corrected Model | 14.464 <sup>a</sup>     | 2   | 7.232       | .191   | .827 | .004                |
| Intercept       | 3378.444                | 1   | 3378.444    | 89.160 | .000 | .479                |
| Pre-Achi.Score  | 13.513                  | 1   | 13.513      | .357   | .552 | .004                |
| Gender          | 1.596                   | 1   | 1.596       | .042   | .838 | .001                |
| Error           | 3675.532                | 97  | 37.892      |        |      |                     |
| Total           | 46161.015               | 100 |             |        |      |                     |
| Corrected Total | 3689.996                | 99  |             |        |      |                     |

Table 6 shows F-ratio of .042 with associated probability (Sig.) of .838 and effect size of .001 under Gender. The associated probability level is greater less than the 0.05 level of significance stated for testing of the null hypothesis. Therefore, the null hypothesis is not rejected, which implies that there is no significant difference in the mean achievement scores of male and female students. In other words, gender has no significant influence on students' achievement in Biology.

### Research Question Four

**Table 7: Mean and Standard Deviation Interest Scores of Students taught Biology using Field trip teaching approach and those taught using Conventional approach**

| Gender | N  | Pre-test  |      | Post-test |      | Mean Diff. |
|--------|----|-----------|------|-----------|------|------------|
|        |    | $\bar{x}$ | SD   | $\bar{x}$ | SD   |            |
| Male   | 45 | 32.68     | 5.82 | 44.33     | 6.70 | 11.65      |
| Female | 55 | 32.50     | 4.83 | 43.53     | 7.88 | 11.03      |

Table 7 shows that the post-test mean and standard deviation interest scores for the male students are 44.33 and 6.70 while that of the female students are 43.52 and 7.56 respectively. The differences in the mean post-test interest scores revealed that male students gained more interest score than their female counterparts.

### Hypothesis Four

**Table 8: An ANCOVA showing No Significant Difference in the Mean Interest Scores of Male and Female Students Biology using Field trip teaching approach and those taught using conventional approach**

| Source          | Type III Sum of Squares | Df | Mean Square | F       | Sig. | Partial Eta Squared |
|-----------------|-------------------------|----|-------------|---------|------|---------------------|
| Corrected Model | 75.975 <sup>a</sup>     | 2  | 37.988      | .758    | .471 | .015                |
| Intercept       | 6004.369                | 1  | 6004.369    | 119.830 | .000 | .553                |

|                 |            |     |        |       |      |      |
|-----------------|------------|-----|--------|-------|------|------|
| Pre-interest    | 60.436     | 1   | 60.436 | 1.206 | .275 | .012 |
| Gender          | 16.593     | 1   | 16.593 | .331  | .566 | .003 |
| Error           | 4860.422   | 97  | 50.107 |       |      |      |
| Total           | 197564.107 | 100 |        |       |      |      |
| Corrected Total | 4936.397   | 99  |        |       |      |      |

Table 8 shows F-ratio of .331 with associated probability (Sig.) of .566 and effect size of .003 under Gender. The associated probability level is greater than the 0.05 level of significance stated for testing of the null hypothesis. Therefore, the null hypothesis is not rejected, which implies that there is no significant difference in the mean interest scores of male and female students. In other words, gender has no significant influence on student's interest in Biology.

### Summary of the Findings

The major findings of the study are as follows:

1. There is a significant effect of field trip teaching approach on students' achievement in Biology.
2. There is a significant effect of field trip teaching approach on students' interest in Biology.
3. There is no significant influence of gender on students' achievement in Biology
4. There is no significant influence of gender on students' interest in Biology

### DISCUSSION OF RESULTS

The discussion of results of this study is based on the research questions and hypotheses of this study.

#### Effects of field trip teaching approach and Conventional approach on students' achievement in Biology

There is significant effect of field trip teaching approach on students' achievement in Biology. The result of study revealed that students taught biology using field trip achieved better than their counterparts taught Biology using a conventional approach of teaching. This could be as a result of exposing students to nature thereby making learning more meaningful and interesting. This is in tandem with the study of Egwu & Okigbo (2021) who examined the effects of field trips on students' achievement in Biology and found out that field trip teaching approach helped to enhance students' achievement in biology.

#### Effects of field trips teaching approach and Conventional approach on biology students' interest in Biology

There is significant effect of field trip teaching approach on students' interest in Biology. This is because field trip experiences enhanced students' understanding of process of science therefore improving students' interest towards biology which then significantly influences achievement in biology. This is in agreement with the study of Omeodu & Abara, 2018 who carried out a study to show that there is significant effect of field trip teaching approach on students' interest in Biology.

### **Influence of gender on students' achievement in Biology**

Findings showed that the even though the female students performed better than the male students when taught using field trip teaching approach, there was no significant difference in their mean achievement scores. This means that the use of field trip teaching approach is not gender biased. This result is in line with Oludipe (2012) whose study revealed that there was no significant difference in the academic achievement of male and female students in biology.

### **Influence of gender on students' interest in Biology**

Analysis of the result revealed that the male students gained more interest score than their female counterparts although there was no significant difference in the male and female interest scores. This could be as a result of the differences male and female students show in their interest in subject or career choice and this differences may be attributed to the psychological differences and cultural influences. This finding is in agreement with the study of Ukor & Abdulbajar (2019) who investigated on the effects of field trip as an Instructional Strategy on SS1 Students' Interest and Achievement in Ecological Concepts.

### **Conclusion**

From the results of the study on enhancing students' interest and achievement in senior secondary school Biology through field trip teaching approach it was discovered that using field trip teaching approach helped to enhance students interest and achievement in Biology. Hence, field trip teaching approach is very good approach to be adopted by teachers in teaching and learning in biology.

### **Implications of the study**

The finding of this study has some educational implications for students, teacher and curriculum planners.

1. The active participation of the students in the class makes the lesson more meaningful because as the student participate and manipulate equipment/materials, they apply their five senses and other skills to their lessons more than when they would have learnt in abstraction or less active in class.
2. The teachers should adopt field trip approach in the teaching of Biology because it is a student-centered approach. Field work activities enhance the understanding of biological concepts and increase the ability to acquire scientific skills by the learners.
3. The curriculum planners are expected to plan for conceptual change over period of years. Since the use of practical activities enhances students' interest and high academic achievement in Biology, it follows that curriculum planners can create the awareness of this approach to teachers by including it in the Biology curricula.

### **Recommendations**

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

1. The government should make "the use of field trip teaching approach" compulsory particularly in the teaching and learning of the abstract concepts in Biology. This means it is necessary that Biology teachers should be trained on how best to involve students during field trip so as to facilitate the interest and achievement of students in lesson.

2. For proper implementation of the field trip approach, it has to be well-funded, by both school authorities and parents. School authorities and parents should put hands together to make field trip teaching approach at all level of learning a successful one, by proper funding.

### Summary

Thus, to enhance students' achievement and interest in learning more about Biology, it is important to put more emphasis on students' out-of-school natural experience and their engagement in informal learning in contextual outdoor environment.

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