



Effect of Field Trip Instructional Strategy on Students' Interest and Achievement in Ecology in Nasarawa State, Nigeria

¹OKA, Usman Apawu & ²SAMUEL, Iwanger Ruth

Department of Science, Technology and Mathematics Education,
Faculty of Education, Nasarawa State University, Keffi, Nigeria

¹Usmanokaapawu1@gmail.com

²ruthsa124@gmail.com

ABSTRACT

This study investigated the effect of field trip instructional strategy on students' interest and achievement in ecology in Nasarawa State, Nigeria. Quasi-experimental, non-equivalent pretest and post-test control group design was employed for the study. Two research questions and two null hypotheses guided the study. The population of the study comprised 5,207 SS1 students in public coeducational schools in West Senatorial District, Nasarawa State, Nigeria. The sample of the study comprised 71 SS 1 students from two intact classes randomly selected from public coeducational secondary schools in West Senatorial District, Nasarawa State, Nigeria. Ecology Interest Rating Scale (EIRS) and Ecology Achievement Test (EAT) were used as instruments for data collection. The reliability of EIRS was determined using Cronbach Alpha and the coefficient obtained was 0.77 and the reliability of EAT was determined using Kuder-Richardson formula 20 (KR₂₀) and this yielded a reliability coefficient of 0.79. Mean and Standard Deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the research hypotheses at 0.05 alpha level of significance. The findings of this study revealed that a significant difference existed in the interest and achievement of students taught Ecology concept using field trip instructional strategy and conventional method. Based on the findings of this study, it was recommended that teachers should be encouraged to use field trip instructional strategy in the teaching of Ecological concepts.

Keywords: Achievement, Ecology, Field trip, Instructional strategy and Interest.

INTRODUCTION

Biology is a science of life concerned with the characteristics of living things, their forms, functions and relationship with one another and with their environment among others. It is a basic knowledge that biology is a prerequisite for studying a number of disciplines such as medicine, agriculture, pharmacy, microbiology, biochemistry and psychology among others (Nnorom, 2015). Biology plays a vital role in the economic development of a nation. This is because recent advances recorded in the field of biochemistry, physiology, ecology, genetics and molecular biology, have made the subject a central focus in most human activities including solutions to the problem 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, (FRN, 2014), 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 (FRN, 2014). Thus, from the above objectives, an outdoor strategy such as field trip has been recommended by FME for its implementation for the accomplishment of biology objectives in the secondary schools in Nigeria. However, despite the

recommendation on field trip as a strategy for teaching biology, many biology teachers in the various secondary schools still teach biology concepts using only traditional method ie lecture method (Etobro & Fabinu, 2017). 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. Ecology is defined as the study of the relationship of organism or group of organisms and their environment; or the science of the interrelationship among living organisms and their environment. Also, ecology is concerned with the biology of groups of organism with functional process on land in the oceans and in fresh water (Emmadiole & Okafor, 2014). The ecology concepts include the following: habitat, population, ecosystem, succession, adaptation, conservation, pollution, cycling material, biological control, community, biotic interaction, soil studies erosion, ecology and disease, sewage disposal, ecological study, feeding relationship, energy, environment to mention just a few. An outdoor strategy seems to have advantages in the teaching and learning of ecology in many ways; some of these are:

- i. It is best to study organisms in their natural environment,
- ii. It also enables teachers to teach for acquisition of scientific skills which is a major goal of science education. Ecology, which deals with the interaction of organisms and environment need to be taught with an appropriate method or strategy of teaching that, requires direct observation of organisms in natural habitat. These organisms may be within or far away from the school.

Field trip according to Cirfat (2014) is an excursion taken outside the classroom for the purpose of making relevant observations and also for obtaining some specific information. Field trip is a teaching strategy in biology which is done by taking students out to the field to provide firsthand experience of organisms in their natural environment (Zumyil, 2016; Amosa, Ogunlade & Atobalet, 2015). Amosa, Ogunlade and Atobatele (2015), state that the use of field trip in teaching and learning helps to bring about effective and efficient learning. Zumyil (2016) agreed that if properly planned, field trips afford the students opportunity to become actively engaged in observing, collecting, classifying, studying relationship and manipulating objects and also have better understanding of certain concepts and phenomena. It is one of the most enjoyable and exciting experience for students studying science especially Biology (Zumyil, 2016). According to Prem (2012), the purpose of field trip is to enhance the curriculum, give students experiential learning experiences, concrete skills such as note-taking, involvement in a real world experience which makes learning more meaningful and memorable. Prem (2012) further states that field trips can add variety to the regular instructional program and help students appreciate the relevance and importance of what they learn in the classroom.

Interest is a psychological state of engagement, experienced in the moment and also a predisposition to engage repeatedly with particular ideas, events or objects over time. Denen and Isah (2015) define interest as the feeling that stimulates an individual to activity without any external influence. The amount of interest an individual has on a particular activity determines the level of success in that activity. Interest powerfully influences our academic and professional choices. The necessity of interest in learning does not only mean that someone has an interest in learning about something. It also means that when someone has an interest in something, it becomes easy and even enjoyable to learn about that topic. Students' interests do not emerge authentically at all times from their own investigation of the world. Therefore, without teacher's scientific and effective instruction, students will not possess interest in certain knowledge. Ajaja (2013) points that one factor that has contributed to low interest in science by students is the method adopted for teaching and learning science. An important aspect of Biology teaching is to create a conducive environment that allows the students to find and develop their interest through participation. This way, students can perceive the learning of biology from a positive and initiative stance in a co-operative way. As students draw their conclusion by active participation and exploration, a pleasure of success comes into being. They feel proud of being successful which can further foster their interest in Biology. When one is interested in what one is learning, one tends to pay a closer attention, and process the information more efficiently, thereby employ more effective learning strategies, such as engaging in critical thinking, making connections

between old and new knowledge, and attending to deep structure instead of surface features (Ezenduka & Achufusi).

Academic achievement refers to a student's success in meeting short or long-term goals in education. Academic achievement means completing secondary school or earning a higher certificate. It is the extent to which a learner is profiting from instructions in a given area of learning (Anungwo, 2014). This is reflected by the extent to which skill or knowledge has been imparted in the learner. Academic achievement is knowledge acquired and skills developed in school subjects, which is generally indicated by marks obtained in tests in an annual examination (Owenvbiugie & Iyoha, 2017).

Denen and Isah (2015) conducted a research on the effect of field-trip instructional strategy on SS1 students' interest and achievement in ecological concepts. The result revealed that field-trip instructional strategy is more effective in enhancing students' interest and achievement in ecological concepts. Aмоса, Ogunlade and Atobatele (2015) conducted a research on the effect of field trip on students' academic performance in Basic Technology in Ilorin metropolis. The findings revealed that there was a significant effect of field trip strategy on students' academic performance in Basic Technology. Zumyil (2019) investigated the effects of computer simulation and field trip instructional strategies on students' achievement and interest in ecology in Plateau Central Education Zone. The results of the study indicated that the use of computer simulation and field trip instructional strategies enhanced students' interest and achievement in Ecology. Ahmad (2014) investigated the Effects of field- trip on Retention and Academic Achievement in Ecology among Secondary School Students in Zaria, Nigeria. The results of the study indicated that the use of field trip instructional strategy enhanced students' retention and academic achievement in Ecology.

Statement of the Problem

The senior secondary school biology curriculum places the basic ecological concepts to be studied under year one. The curriculum specified the performance objectives to be achieved as well as the activities to be carried out in the course of teaching and learning to facilitate understanding of the concepts being taught. It is therefore, necessary to create the awareness of ecology as a subject early in the life of the students. Failure to comprehend ecological concepts has contributed to the general poor performance of candidates in question that deal with ecological concepts in the West African Senior Certificate Examinations (WASSCE). The need to redress this academic problem is to find instructional strategy that could assist in enhancing students' interest and achievement of ecological concepts. This is the focus of this study.

Objectives of the Study

The purpose of this study was to investigate the effect of field trip instructional strategy on students' interest and achievement in ecology in Nasarawa State, Nigeria. Specifically, the study sought to:

1. Determine the mean interest scores of students taught ecology using field trip instructional strategy and the conventional method.
2. Determine the mean achievement scores of students taught ecology using field trip instructional strategy and the conventional method.

Research Questions

1. What are the mean interest scores of students taught ecology using field trip instructional strategy and the conventional method?
2. What are the mean achievement scores of students taught ecology using field trip instructional strategy and the conventional method?

Hypotheses

H₀₁: There is no significance difference between the mean interest scores of students taught ecology using field trip instructional strategy and the conventional method.

H₀₂: There is no significance difference between the mean achievement scores of students taught ecology using field trip instructional strategy and the conventional method.

METHODOLOGY

Quasi-experimental, non-equivalent pretest and post-test control group design was employed for the study. The population of the study comprised 5,207 SS1 students in public coeducational schools in West Senatorial District, Nasarawa State, Nigeria. The sample of the study comprised 71 SS 1 students from two intact classes randomly selected from public coeducational secondary schools in West Senatorial District, Nasarawa State, Nigeria. The experimental group I (n=30) and control group

(n=41) were taught using field trip instructional strategy and conventional method respectively for six weeks. Ecology Interest Rating Scale (EIRS) and Ecology Achievement Test (EAT) were used as instruments for data collection. EIRS contained 10 items designed to determine students' interest in Ecology. EIRS was rated using a four-point rating scale. The options were; Strongly agreed (SA) = 4 points, Agree (A) = 3 points, Disagree (D) = 2 points and Strongly Disagreed (SD) = 1 point. EAT consisted of 30 multiple choice achievement test items with 4-options A-D designed to measure students' achievement. The instrument was subjected to content and face validity by two experts in Science Education from Nasarawa State University, Keffi, Nasarawa State and Benue State University, Benue State. The reliability of EIRS was determined using Cronbach Alpha and the coefficient obtained was 0.77 and the reliability of EAT was determined using Kuder-Richardson formula 20 (KR₂₀) and this yielded a reliability coefficient of 0.79.

Experimental Procedure

During the first week of the experiment, a pretest was administered. The treatment lasted for six weeks. During this period, students were taught six selected concepts in Ecology (River, Pond, Marsh, farm land, Mountain) using a double period lasting for 80 minutes. The experimental group was taught using field trip instructional strategy. In this group, students were divided into six groups (five students in each group) to carry everybody along. Group leaders were appointed to each group to co-ordinate the activities of the group. Each member of the team was given work sheet that contained specific questions to answer. During the trips the students worked in groups, asked questions and collected samples where possible. They observed, and recorded all that was required strictly under the guidance of the questions designed. They were encouraged to use their field guide sheets and discuss with each other what they saw, touched and heard during the trip.

The students were encouraged not to pick sample flowers or vegetation and not to disturb animals in their specific habitat except instructed to do so. They used cameras, small tape recorders or mandated to record specific information. Each group was given 40 minutes only. They were asked to collect some samples according to the lesson plan designed. After each trip students returned from their group investigation, they were allowed to discuss and put together their experiences creatively. Each team was asked to present their experiences to the rest of the groups on what they had observed and recorded in the field.

Anybody can be called to present and when one team or group completed or showed what they have observed and learned from investigation the other team or group took over. Each group was given 40 minutes only. The presentation awarded marks and the data or result collected was analyzed. The control group was taught using the conventional method. The last one week was used for the administration of posttest after treatment using EAT and EIRS. This makes a total of eight weeks.

DATA ANALYSIS/RESULTS

Mean and Standard Deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the research hypotheses at 0.05 alpha level of significance.

Research Question One

What are the mean interest scores of students taught ecology using field trip instructional strategy and the conventional method?

Table 1

Mean Scores and Standard Deviations in EIRS of Students in the Experimental Groups

Teaching Method	Type of Test	No. of Students	Mean	SD	Mean Gain
Field Trip	Pre-interest	30	36.29	12.45	21.50
	Post-interest	30	57.79	13.74	
Conventional Method	Pre-interest	41	34.95	12.09	19.83
	Post-interest	41	54.78	13.55	

Table 1 shows that the mean gain for the interest scores of students taught Ecology concepts using field trip instructional strategy and conventional method are 21.50 and 19.83 respectively.

Research Question Two

What are the mean achievement scores of students taught ecology using field trip instructional strategy and the conventional method?

Table 2. Mean Scores and Standard Deviations in EAT of Students in the Experimental Groups

Teaching Method	Type of Test	No. of Students	Mean	SD	Mean Gain
Field Trip	Pretest	30	18.78	0.45	6.37
	Posttest	30	25.15	0.62	
Conventional Method	Pretest	41	17.29	0.33	5.69
	Posttest	41	22.98	0.58	

Table 2 shows that the mean gain for the achievement scores of students taught Ecology concepts using field trip instructional strategy and conventional method are 6.37 and 5.69 respectively.

Hypothesis One

There is no significance difference between the mean interest scores of students taught ecology using field trip instructional strategy and the conventional method.

Table 3

ANCOVA Result on Students' Interest in EIRS

Source of Variation	Sum of Square	df	Mean Square	F-calculated	Sig
Covariance Pre-interest	1543.02	2	39.62		
Mean Effects	2535.22	1	2421.72	87.04	
Main Effect	25975.84	1	25975.84	22.17	0.000
Residual	54016.55	81		11.06	0.012
Total	84070.63	85			

Table 3 revealed a significant difference in the achievement taught Ecology concept field trip instructional strategy and conventional method. The calculated F-value was 22.17 as against the critical F-value of 1.87 at 0.05 level of significance. Therefore, the hypothesis was not rejected. This implies that significant difference existed between the two groups when the covariate (pre-interest) was controlled.

Hypothesis Two

There is no significance difference between the mean achievement scores of students taught ecology using field trip instructional strategy and the conventional method.

Table 4

ANCOVA Result on Students' Achievement Scores in EAT

Source of Variation	Sum of Square	df	Mean Square	F-calculated	Sig
Covariance Pre-test	597.02	2	532.09		
Mean Effects	11535.22	1	31.72	41.22	
Main Effect	295.64	1	295.64	30.73	0.001
Residual	433.07	81		19.06	0.001
Total	84070.63	85			

Table 4 revealed a significant difference in the achievement taught Ecology concept using field trip instructional strategy and conventional method. The calculated F-value was 30.73 as against the critical F-value of 1.98 at 0.05 level of significance. Therefore, the hypothesis was rejected. This implies that significant difference existed between the two groups when the covariate (pre-test) was controlled.

DISCUSSION

The findings of this study revealed that a significant difference do exist in the interest and achievement of students taught Ecology concept using field trip instructional strategy and conventional method. This is in line with the findings of Prem (2012), Ahmad (2014), Denen and Isah (2015), Amosa, Ogunlade and Atobatele (2015) and Zumyil (2019) who in their different researches found out that field trip enhances students' interest and achievement in ecological concepts. The reason for the enhanced interest and achievement could be because students had the opportunity to become actively engaged in observing, collecting, classifying, studying relationship and manipulating real objects and situations, also they had a better understanding of certain concepts and phenomena.

CONCLUSION

The findings of this study revealed that a significant different existed in the interest and achievement of students taught Ecology concept using field trip instructional strategy and conventional method.

RECOMMENDATIONS

Based on the findings of this study, it was recommended that,

1. Teachers should be encouraged to use field trip instructional strategy in the teaching of Ecological concepts.
2. Seminars and workshops should be organized by stakeholders in Biology to train teachers on the use of field trip instructional strategy to help enhance interest and improve the achievement of students in ecology.

REFERENCES

- Ahmad, Y. (201). Effects of field- trip on retention and academic achievement in ecology among secondary school students in Zaria, Nigeria. A thesis submitted to the school of postgraduate studies Ahmadu Bello University, Zaria, Kaduna State.
- Ajaja, P.O. (2013). Which strategy best suits biology teaching? Lecturing, concept mapping, cooperative learning or learning cycle? *Electronic Journal of Science Education*, 7 (1), 102 – 108.
- Amosa, A. G.; Ogunlade, O. & Atobatele, A. S. (2015). Effect of field trip on students' academic performance in Basic Technology in Ilorin metropolis, Nigeria. *Malaysian Online Journal of Educational Technology*, 3(2), 1-6.
- Anungwo, M. N. (2014). Enhancing the academic performance of Nigerian students through creative teaching and assessment procedures. Proceedings of the 55th Annual Conference of Science Teachers Association of Nigeria. 90 – 97.
- Cirfat, A. B. (2014). Effects of experiential learning strategy on secondary school students' self-esteem and achievement in practical skills. An unpublished Ph.D thesis in the department of Curriculum and Teaching, Faculty of Education, Benue State University Makurdi.
- Denen, D.U. & Isah, S.A. (2015). Effect of field-trip instructional strategy on SS1 students' Interest and achievement in ecological concepts. *International Journal of Research in Science, Technology and Mathematics Education*, 3(1), 1-11.
- Emmadiole, N. B. & Okafor, C.U. (2014). Strategies teachers can use to inspire creativity in senior Secondary Biology Students. Proceedings of the 55th Annual Conference of Science Teachers Association of Nigeria, 200 - 206.
- Etobro A. B., & Fabinu, O. E. (2017). Students' Perceptions of Difficult Concepts in Biology in Senior Secondary Schools in Lagos State. *Global Journal of Educational Research*, 16, 139-147.
- Ezenduka, C. U. & Achufusi, J. N (2014). Enhancing creativity in senior secondary school biology teaching through creative learning model approach. Proceedings of the 55th Annual Conference of Science Teachers Association of Nigeria, 207 - 214.
- Federal Republic of Nigeria (2014). National policy on education. NERDC Press Lagos.
- Nnorom, N. R. (2015). Effect of Cooperative Learning Instructional Strategy on Senior Secondary School Students Achievement in Biology in Anambra State, Nigeria. *International Journal for Cross-Disciplinary Subjects in Education*, 5(1), 2424-2427.

- Owenvbiugie, R. O., & Iyoha, D. O. (2017). Effect of Instructional Scaffolding on Academic Performance of Students in Financial Accounting in Secondary Schools in Delta State, Nigeria. *Journal of Education Research and Behavioral Sciences*, 6(2), 021-028.
- Prem, L. (2012). Field trip strategy. Retrieved from 202/06/field-tripstrategy.htm/?m=/eprogressive portfolio.b Press Paris.
- Zumyil, C. F. (2019). Effects of computer simulation and field trip instructional strategies on students' achievement and interest in ecology in Plateau Central Education Zone, Nigeria. A thesis submitted to the postgraduate school, Benue State University, Makurdi, Benue State.