

# Effects of Fieldwork on Secondary School Teachers' Attitude towards the Study of Ecology in Ekiti State

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## Abstract

The study focused on the effect of field work on Secondary School teachers' attitudes towards the study of ecology. The study investigated the effect of variables like sex, teacher's qualification, and teaching experience on their attitudes toward the study of ecology. A pretest – post test design was used for the study. The population for the study consisted of biology teachers in Ekiti State Senior Secondary Schools. The sample was 180 senior secondary school biology teachers randomly selected from the three senatorial districts in the state. The only instrument used in collecting relevant data for the study was a questionnaire consisting of two sections, A and B. Section A consisted of personal bio-data of the subjects while section B considered of twenty items which elicited information on their attitude towards the study of ecology. Two general questions were raised and three hypotheses were tested. Data collected was analyzed using the descriptive statistics of mean and standard deviation as well as inferential statistics of t-test and analysis of covariance (ANCOVA). The results showed that the teacher's attitude towards the study of ecology was more positive after the treatment. The result also revealed that qualification and teaching experience of teachers had no significant effect on their attitude towards ecology fieldwork. It was recommended that seminar should be organized for teachers on the necessity of using field work method of teaching ecological aspect of biology rather than using theoretical approach only.

**Keywords:** Fieldwork, Secondary, Attitude Study, Ecology

## Introduction

Ecology, as a branch of biology, is concerned with the scientific study of the nature and effect of reciprocal interaction of individual organisms between and within population of the same species or communities of different populations and the main factor which constitute the effective environment in which the organism, population or communities live (Lock & Tilling, 2002).

Ecology is usually considered a branch of biology, the general science that studies living organisms. Ecology draws heavily on many other branches of science, especially geography, methodology, genetics, chemistry and physics etc. Ecology can also be sub-divided, according to the species of interest, into fields such as animal ecology, plant ecology, insect ecology, and so on. Another frequent method of subdivision is biome studies e.g. acetic ecology (or polar ecology), tropical ecology, desert etc. The primary technique used for investigation is often used to sub-divide the discipline into groups such as chemical ecology, genetic ecology, field ecology, statistical ecology, theoretical ecology and so forth.

Ecology is seen as an essential part of establishes of all pupils, which apart from being a good academic subject, has many useful applications of maintaining the healthier and more productive biosphere for the life of man and other living things.

Biology as a science subject in the secondary school program occupies a unique position. The policy for secondary school, among other things, stated that all students must compulsorily offer one science subject which may be physics, chemistry or biology. However, almost all students offer biology, thus, making it more or less a compulsory subject for all.

Fieldwork affords teachers the opportunity to which our experienced door educators who often used different styles of teaching than they themselves being employed. It also affords them the opportunity of improving their own knowledge of the subject and pick up new skills as well as ideas that they could take back to their own classrooms.

Crayford (1992), in one of his studies, identified the attitude of teachings, among other factors, as one main barrier to the effective use of fieldwork in teaching ecology. He also found out that, in the United Kingdom, despite the long years of teaching experience disclosed by the teachers, they still had negative attitude towards the teaching of fieldwork aspect of ecology. Nevertheless, for many teachers who engaged in fieldwork, the opportunities for personal and social development are seen as highly significant. Lock and Tilling (2002) also observed that fieldwork approach is one of the approaches to the effective teaching of ecology and that, good and effective as this approach is, it is greatly hindered by the attitude of teachers to ecological fieldwork.

It is axiomatic to say that teachers should be professionally trained, Seweje and Jegede (2005) pointed out that the ability to teach is derived only from one's academic background but it is based upon outstanding pedagogical skill particularly due to training.

Babatunde (1982) in his study of attitude of teachers and students toward Biology and students' achievement in the subject revealed that, about 94.4% of all teachers had very positive attitude to biology while the remainder had mildly positive attitude.

### **Purpose of the Study**

The purpose of this study was to determine the effect of fieldwork on secondary school teachers' attitude towards the study of ecology. The study also investigated the influence of teachers' sex, qualification and teaching experience on their attitude to ecological field work.

**Research Questions**

1. What is the general attitude of teachers toward the study of ecology before and after their exposure to fieldwork?
2. Which of the two methods used (i.e. seminar and fieldwork) will produce a more positive attitude in teachers?

**Research Hypotheses**

1. There is no significant effect of qualification on teachers' attitude to ecological fieldwork.
2. There is no significant difference between the attitudes of male and female teachers to ecological fieldwork.
3. There is no significant effect of experience of teachers' attitude to ecological fieldwork.

**Research Design**

The study adopted the pretest – posttest quasi-experimental design. The design could be represented diagrammatically as shown below.

O <sub>1</sub>	X <sub>1</sub>	O <sub>2</sub>	(Experimental group I: seminar)
O <sub>3</sub>	X <sub>2</sub>	O <sub>4</sub>	(Experimental group II: fieldwork)
O <sub>5</sub>	—	O <sub>6</sub>	(Control group)

Where O<sub>1</sub>, X<sub>3</sub>, O<sub>5</sub> is pretest

O<sub>2</sub>, X<sub>4</sub>, O<sub>6</sub> is posttest

X<sub>1</sub> is Treatment (seminar)

X<sub>2</sub> is Treatment (fieldwork)

Implies no treatment

**Sample and Sampling Technique**

The sample for the study comprised 180 teachers, randomly selected from three selected public secondary schools using the multi-stage sampling technique. The first stage involved the random selection of three Local Government Areas while the second stage involved the selection of one school from each selected Local Government Area using the purposive sampling technique. The final stage involved the selection of thirty male and female teachers respectively, from each of the selected schools, using the stratified randomly sampling technique.

**Research Instrument**

The study use a questionnaire which is made up of section A and B. section A concerns information on the personal bio data of the subject, while section B constituted of twenty item to elicit information on the attitudes of teachers toward the study of ecology. To show which item will indicate positive attitudes, the following scoring procedure was used; Strongly Agree (SA) = 4; Agree (A) = 3; Disagree (D) = 2; Strongly Disagree (SD) = 1; and to show which item will indicate negative attitude, the above scoring procedure was reversed (i.e. Strongly Agree (SA) = 1; Agree (A) = 2; Disagree (D) = 3; Strongly Disagree (SD) = 4).

**Validity of the Instrument**

To validate the instrument, the items were given to three experienced secondary school biology teachers and experts in science education and test and measurement for face and

content validity. Their comments were considered in producing the final copy of the instrument.

The reliability of the instrument was ascertained using test-retest method. The instrument was administered to 20 teachers outside the target sample two times within an interval of two weeks. The two scores obtained from the administration were correlated using Pearson Product Moment Correlation formula. The reliability coefficient of 0.80 was obtained which was adjudged high enough for the study of this type.

### Experimental Procedure

After selecting the subjects for the study, the researcher randomly assigned them to the two treatment groups after which the pre-test was administered to the two groups respectively, no treatment was given to the control group. The seminar group was given talk on how to teach the ecological aspect of biology, why the field work group was taken to the school farm, and school field and were told how to teach ecology by using their school garden and field with or without financial backing from the government. This involves practical demonstrations, where necessary.

### Data Analysis

Data collected was analyzed using mean, standard deviation, t-test statistics and analysis of covariance (ANCOVA).

### Results

**Research Question 1:** What is the general attitude of teachers toward the study of ecology before and after their exposure to fieldwork?

The answer to this question is presented in Table 1 below:

Table 1:

*Teachers' attitude to ecological fieldwork before and after the treatment*

	Pre-test		Post-test	
	Mean	Standard deviation	Mean	Standard deviation
Teachers	51.25	4.8	54.65	5.83

A comparison of the pretest and post-test attitudinal mean scores of the teachers, as displayed in Table 1, showed that the post-test mean score (54.65) is higher than the pretest mean score (51.25). This implies that the treatment produced a positive effect on the attitude of these teachers to ecological fieldwork.

**Research Question 2:** Which of the two methods used (i.e. seminar and fieldwork) will produce a more positive attitude in teachers?

The answer to this question is presented in Table 2 below:

**Table 2:***Teachers' attitude to ecological fieldwork before and after the treatment*

	Pre-test		Post-test	
	Mean	Standard deviation	Mean	Standard deviation
Fieldwork	52.54	6.53	56.52	10.54
Seminar	46.99	10.45	56.54	6.41

The result from table 2 showed that using the fieldwork method to teach ecological concept of biology produces a more positive attitude in teachers.

### Testing of Hypotheses

**Hypothesis 1:** There is no significant effect of qualification on teachers' attitude to ecological fieldwork

**Table 3:**

*Summary of the analysis of covariance (ANCOVA) of teachers' qualification and their attitude towards ecological fieldwork*

Source	SS	df	MS	F-cal	F-table
Corrected model	376.377	4	94.094	5.224	3.06
Covariance (pre-test)	335.342	1	335.342	18.618	4.54
Qualification	24.409	3	8.136	0.452	3.29
Error	3152.1	175	18.012		
Corrected Total	646.550	179			
Total	4534.778	180			

$P < 0.05$

The result of analysis of covariance (ANCOVA) showed that f-cal (0.452) is less than f-tab (3.29) at 0.05 level of significance. The null hypothesis is, therefore, accepted. Thus, teachers' qualification does not affect their attitude towards ecological field work.

**Hypothesis 2:** There is no significant difference between the attitudes of male and female teachers to ecological fieldwork.

**Table 4:**

*T-Test Showing The Attitude Of Male And Female Teachers To Ecological Fieldwork*

Group	N	Mean	SD	Df	t-cal	t-table
Male	80	52.25	8.31			
Female	100	56.25	2.0	179	1.558	1.96

$P < 0.05$

The result of the analysis presented in table 4 showed that the calculated t-value (1.558) is less than the table value (1.96) at 0.05 level of significance. The null hypothesis is accepted. It could, therefore, be concluded that teachers' sex do not affect their attitude toward ecological fieldwork.'

**Hypothesis 3:** There is no significant effect of experience on teachers' attitude to ecological fieldwork.

*Table 5:*

*Summary of the analysis of covariance (ANCOVA) of teachers' teaching experience and their attitude towards ecological fieldwork*

<b>Source</b>	<b>SS</b>	<b>df</b>	<b>MSS</b>	<b>F-cal</b>	<b>F-table</b>
Corrected model	364.043	3	121.348	6.873	3.24
Covariance (pre-Test	333.611	1	333.611	18896	4.49
Teaching experience	12.075	2	6.038	.342	3.63
Error	3109.623	176	17.657		
Corrected Total	646.550	179			
Total	4463.902	180			

$P < 0.05$

The result of the analysis in Table 5 showed that the calculated value of F (.342) is less than the table value (3.63). The null hypothesis is retained. This implies that teachers' teaching experience does not affect their attitude toward ecological fieldwork. Though this is contrary to the researcher's opinion, one would have thought that teachers who had long year of teaching experience ought to have more positive attitude.

### **Discussion**

The results of the study revealed that the teachers exposed to fieldwork method had more positive attitude than their counterparts in the seminar group. This shows that ecological aspect of Biology should not be taught theoretically in order to impact the much needed knowledge to the students which are our targets. This supports the view of Cooper (1991) who pointed out that fieldwork is essential in the training of some professions.

The result also revealed that qualification does not affect teachers' attitude towards the study of ecology. This study is in consonant with the view of Hoyle (1980), who pointed out that the ability to teach is derived not only from one's academic background but it is based upon outstanding pedagogical skill particularly due to training.

The finding of this study contradicts the researcher opinion that teachers with long year experience should have better attitude to ecological fieldwork. The fact that one is long in a profession does not actually means that he is conversant with all that is going on there. This is why it is necessary for teachers to be current in their field. This could be achieved by reading journals and attending seminars and conferences at both local and international levels so as to keep abreast of happenings in the field.

### **Conclusion**

The finding of this study had revealed that using the field work to teach ecological aspect of biology improves the attitude of teachers toward the teaching of ecological aspect of biology and that teachers' qualification, sex and teaching experience do not affect their attitude toward ecological fieldwork.

### Recommendation

Based on the findings above, it is recommended that teacher should be encouraged to adopt the field work method of teaching ecology aspect of biology, as this could enhance students' understanding of this aspect of biology which most of them claim to be difficult.

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