

CONFERENCE THEME: TEACHING IN A CHANGING AFRICA

TITLE OF PAPER:

EFFECTS OF *OUTDOOR ACTIVITIES AND GENDER ON STUDENTS'*

ENVIRONMENTAL ATTITUDE TO BIOLOGY

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ABSTRACT

The teachers' use of lecture method in teaching has been observed to be ineffective in bringing about the right attitude towards the environment and environmental problems. Several researches have also revealed the need to employ methods that are activity-oriented in order to inculcate positive environmental attitude into the learners. The need to employ outdoor activities in different methods and strategies therefore arose. This study therefore investigated the effect of outdoor activities and gender on students' environmental attitude to Biology.

The study was carried out on two hundred and forty (240) senior secondary school II students from four schools in two local government areas of Ibadan in Oyo State, Nigeria, using a pre-test, post-test control group, quasi experimental design. The instruments used comprise of Students' Environmental Attitude Scale (SEAS), Instructional Guide for Teaching with Outdoor Activities, Instructional Guide for teaching with Conventional method and Evaluation Sheet for assessing the teachers' performance during training. The actual procedure followed the steps below:

- 1. Two weeks of training the participating teachers using the instructional guides.*
- 2. Third week was used in conducting pre-test on the subjects.*
- 3. The next eight weeks for the administration of the treatment on the subjects. The treatment groups were exposed to outdoor activities which are educational activities embarked upon outside the regular classroom activities with the aim of making the students observe what is going on in their environment, to notice the environmental problems caused as a result of negative attitude towards the environment and the need for a positive attitude towards the environment.*
- 4. The final week was used for conducting the post-test on the subjects.*

Data analysis revealed a significant effect of outdoor activities on students' environmental attitude ($F=5.067$ $P<0.05$). There was also a significant effect of gender on the environmental attitude of students ($F=6.939$, $P<0.05$). This shows that the use of outdoor activities/fieldtrips has a powerful effect on the attitude of students towards the environment. Therefore, outdoor activities have been observed to have brought about significant attitudinal change in students, and are hereby recommended for the teaching and learning of environmental education concepts in Biology for both sexes.

INTRODUCTION

Environmental education is generally concerned with the development of motivation necessary to make informed decisions about environmental issues. It is a learning process that increases the people's awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations and commitments to make informed decisions and take responsible action (UNESCO's Tbilisi Declaration, 1978).

Teaching at any formal level of education should never be deemed a "talk and chalk" affair. Today, effective and meaningful teaching should be considered a process in which both sides of the teachers and learners are actively engaged. If this process is to be fully realized, each significant step should be backed up with learning resources which are designed to make teaching easier and learning more meaningful (Ayodele 2001 as cited by Orenuga 2006).

EE requires a 'student-initiative education' in the sense that it is fundamentally problem oriented. The inadequate environmental ethics, ignorance and inadequate environmental awareness, knowledge and skills in pupils and students in particular, can only be removed through such education (Ogueri, 2004). There is therefore the need for a methodology that will make the students functional in Environmental Education. The need of the hour is to have environmentally conscious citizens who are concerned about saving the environment from disasters. It might happen only when people are knowledgeable about their environment and associated problems; are aware of the solutions to these problems and are motivated to work for that. This naturally means change in attitude and behaviour of the public (Above, 2001). The more we learn the better we realize the worth of our environment.

Gender according to the *Oxford Advanced Learners Dictionary* refers to the fact of being male or female. Many researches have been carried out in the past on factors that affects the performance of students in science and science related subjects. Amongst other factors that have received attention are learner characteristics such as gender.

Attitude is a way of life or human behavioral pattern which can always serve a direction to human endeavour (Afuwape, 2003). An attitude is a hypothetical construct about a mental state which is inferred from verbal reports and behavioral observation. As a concept, attitude

takes its reality from our own introspection. We believe in attitudes and find them useful for understanding the behavior of others (Herbelein). Attitudes are based on values, have horizontal and vertical structure and tend from general to specific. Without doubt, one of the most important influences on behavior is attitude. It has long been known that the basis for many environmental problems and issues is irresponsible environmental behavior (Ramsey & Rickson 1976).

Environmental attitudes are fundamentally important, widely discussed, frequently measured, and poorly understood. Environmental attitudes are conceptualized in terms of attitude theory as being composed of beliefs and affect toward an object. Environmental concern appears to be a specific belief which is largely embedded in cognitive structure and should be considered an opinion rather than an attitude.

Although the issue of sex and achievement in science is an important area that has involved a lot of researches, available results have not yielded a conclusive trend in performance (Bilesanmi-Awoderu, 2002). For instance Have and Shayar (1981), Okpala and Onocha (1988) have found significant gender – group difference (in favour of boys). Studies such as that of Imogene (1998) do not establish such differences or at most found gender group differences to some levels of education and some science topics only (Raimi & Adeoye, 2002). According to Owoyemi (2007), students' achievement in physical chemistry courses has nothing to do with attitude or whether the student is male or female. Ogunleye (2002) and Olatundun (2008) in their different research works revealed in their findings that female possessed more verbal commitment to the environment. Raimi and Adeoye's (2002) research results show that no significant effect(s) of gender and ability existed on science students' attitude.

There is therefore a conflicting nature of results from researches that focus on gender and science and science related subjects.

The present study is thus interested in gender influence on the learning outcomes of Environmental Education Concepts in Biology with the belief that more studies on this learner characteristic can bring about to some degree a resolution of the conflicting nature of the subject.

STATEMENT OF THE PROBLEM

The problem this study seeks to address, therefore, is to investigate the effect of outdoor activities and gender on secondary school students' environmental attitude. It is to reveal how outdoor activities could bring about functional and holistic environmental education and an all-round national development and systemic change.

The study further seeks to examine the effects of gender and school location on subjects' attitude to environmental issues and concepts.

HYPOTHESES

The following null hypotheses were tested at 0.05 levels of significance.

Ho 1: There is no significant main effect of outdoor activities on students' environmental attitude

Ho 2: There is no significant main effect of gender on students' environmental attitude

METHODOLOGY

This study adopted a pre-test, post-test control group, quasi experimental design to determine the effect of outdoor educational activities on secondary school students' environmental attitude in Ibadan metropolis, Nigeria.

The study also made use of a 2x2x2 factorial matrix which is represented below.

Table 1: The 2x2x2 factorial matrix

Treatment	School Location	Gender	
		Male	Female
Experimental	Rural		

	Urban		
Control	Rural		
	Urban		

The following variables were in the study.

Independent variable /treatment

- Outdoor educational activities
- Conventional teaching method/Lecture method

Dependent Variables

- Attitude to environmental problems

Moderator Variables

- Gender (Male and Female)
- School location

The researcher selected 240 Senior Secondary School Two (2) students (SS II) from four purposively selected secondary schools in urban and rural areas of Akinyele and Ibadan North Local government areas of Oyo State.

The purposive sampling technique was used to assign the schools to experimental and control groups for the study. This was done to ensure that the schools to be used do not fall majorly in either the rural or urban areas. Two out of the four schools were assigned as experimental group and two as control group. Intact classes were be used. The Biology teachers of the schools were be included in the study

INSTRUMENTS

Four instruments were designed and used by the researcher in this study. These are:

- (a) Students' Environmental Attitude Scale (SEAS)
- (b) Instructional Guide for Teaching with Outdoor Activities(IGTOA)

- (c) Instructional Guide for Teaching with Conventional Method (IGTCM)
- (d) Evaluation Sheet for Assessing Teachers

STUDENTS' ENVIRONMENTAL ATTITUDE SCALE (SEAS):

This is an instrument consisting of fourteen (14) items and six (6) negative items with responses of True or False to be chosen by the students. Each item was designed to test the students' sense of responsibility towards the environment and how they as students could, through their attitude, show how much of environmental education ethics has been inculcated in them in order to conserve natural resources and solve environmental problems around them. The instrument was also trial tested and Cronbach Alpha measure was used to ensure its reliability. The reliability coefficient of the test was calculated as 0.82. This shows that all the items in the instruments were reliable.

INSTRUCTIONAL GUIDE FOR TEACHING WITH OUTDOOR ACTIVITIES (IGTOA):

This is an instructional guide for teachers participating in the experimental group. It contains the statement of topic, objectives and the procedure expected to be followed by the teachers in teaching of Environmental Education concepts during outdoor activities. This was prepared and used in the training of teachers to allow for uniformity in the teaching method.

INSTRUCTIONAL GUIDE FOR TEACHING WITH CONVENTIONAL METHOD (IGTCM):

This is an instructional guide for teachers participating in the classroom using the conventional method/lecture method of teaching. It contains the statement of topic, objectives, instructional materials and the procedure expected to be followed by the teachers in teaching of EE concepts in the classroom. This was prepared and used in the training of teachers to allow for uniformity in the teaching method.

EVALUATION SHEET FOR ASSESSING TEACHERS (ESAT):

This instrument was designed to be used in evaluating the teachers' effective use of the instructional guides during the teaching process. It shows their presentation of concepts, mastery of the topics, use of materials and activities as directed and how effective their presentation will be for the mastery of concepts by the students.

PROCEDURE FOR DATA COLLECTION

In carrying out this research, the plan of work was be as follows

1 - 2 weeks _____ Training of teachers/scrutiny

1 week _____ Pre – test

8 weeks _____ Treatment

1 week _____ Post test

Total = 12 weeks

TRAINING OF TEACHERS

The researcher took time to train the teachers in the use of the teacher's guide provided so as to have uniformity. The areas of disparity of ideas were discussed and the reason why the guide should be used as expected was explained. The teachers were trained to teach with the Instructional Guides (IGTOA) in Experimental Groups.

PRE – TEST

The instrument (SEAS) was administered to the students to test their level of understanding and acquisition of knowledge of environmental education concepts in Biology so as to be able to compare the effect of the treatment on them.

TREATMENT

The students were subjected to the conventional method of teaching and the outdoor activities by their Biology Teachers. The conventional method involves the use of lecture method and various teaching materials such as charts, pictures etc while the experimental group used both the lecture methods alongside with charts, pictures and field trips to enhance their understanding of the concepts that were being taught to them.

POST-TEST

The tests were administered on the subjects after the various treatments with the help of their Biology teachers in the school. The students' scripts were collected and marked. The scores were used to determine the extent of the effect of outdoor educational activities on students' attitude in Environmental Education.

PROCEDURE FOR DATA ANALYSIS

Data collected were analyzed using descriptive statistics such as frequency counts, means, percentages and standard deviation and inferential statistics such as Analysis of Covariance (ANCOVA). The hypotheses were tested at 0.05 levels of significance. Multiple Classification Analysis (MCA) was also used to determine the magnitude of the differences of the various groups.

RESULT

The result of this study and the summary in the tables are hereby presented using the research hypotheses as guide.

TABLE 2: *Descriptive Statistics of Post-Test Environmental Attitude according to Treatment, Gender and School Location.*

						Mean	Std. Deviation	N	
Treatment	Experimental	Gender	Male	Location	Urban	18.42	1.349	24	
					Rural	17.79	1.841	29	
					Total	18.10	2.441	53	
			Female	Location	Urban	17.86	1.807	36	
					Rural	14.90	2.700	31	
					Total	16.49	2.693	67	
		Total	Location	Urban	18.08	1.650	60		
				Rural	17.05	2.418	60		
				Total	17.37	2.362	120		
		Control	Gender	Male	Location	Urban	17.89	2.720	35
						Rural	15.90	2.568	24
						Total	16.90	2.384	59
	Female			Location	Urban	17.40	1.472	25	
					Rural	16.56	2.645	36	
					Total	16.90	2.264	61	
	Total		Location	Urban	17.68	2.281	60		
				Rural	15.38	2.662	60		
				Total	16.73	2.589	120		
	Total		Gender	Male	Location	Urban	18.10	2.264	59
						Rural	16.75	2.441	53
						Total	17.46	2.434	112
		Female		Location	Urban	17.67	1.680	61	
					Rural	15.79	2.777	67	
					Total	16.69	2.496	120	
Total	Location	Urban	17.88	1.992	120				
		Rural	16.22	2.667	120				
		Total	17.05	2.493	240				

Table 2 presents the descriptive statistics of students with respect to environmental attitude. It comprises the mean score, standard deviation and numbers of students involved in the research. A detailed study of the table reveals with respect to attitudinal disposition towards the environment, the experimental groups' performance was better than that of the control group. Also, the male students performed better than their female counterpart and the urban students performed better than the students in the rural area. There was the need for further statistical clarification which was done using the Analysis of Covariance - an inferential statistical method

to test the hypotheses in order to show if the difference in the mean scores were significant or not. It was also used to make up for the initial differences that may exist between the groups since intact classes were used.

Ho1: There is no significant main effect of outdoor activities on students' environmental attitude.

TABLE 2: Summary of 2x2x2 Analysis of Covariance (ANCOVA) of Post-Test Environmental Attitude according to Treatment, Gender and School Location.

		Type III Sum of Squares	df	Mean Square	F	Sig.
Source	Corrected Model	304.443 ^a	8	38.055	7.444	.000*
	Intercept	929.712	1	929.712	181.856	.000
	ATTI_PRE	4.971	1	4.971	.972	.325
	TREATMENT	25.907	1	25.907	5.067	.025*
	GENDER	35.473	1	35.473	6.939	.009*
	LOCATION	120.434	1	120.434	23.557	.000*
	TREATMENT * GENDER	.064	1	.064	.012	.911
	TREATMENT * LOCATION	71.811	1	71.811	14.046	.000*
	GENDER * LOCATION	5.020	1	5.020	.982	.323
	TREATMENT * GENDER * LOCATION	.238	1	.238	.046	.830
	Error	1180.957	231	5.112		
	Total	71254.000	240			
	Corrected Total	1485.400	239			

a. R Squared = .205 (Adjusted R Squared = .177)

The result of the 2x2x2 Analysis of Covariance on Table 2 reveals that there is a significant effect of outdoor activities on students' environmental attitude ($F=5.067$ $P<0.05$). The hypothesis was therefore rejected. This means that the experimental group scored higher in environmental attitude ($x=17.37$) than the control group ($X =16.73$). This shows that students in the experimental group are more disposed in their attitude towards the environment than those in the control group.

Table 3: Multiple Classification Analysis (MCA) on Post test Environmental Attitude by Treatment, Gender and School Location.

Grand Mean = 17.05

Treatment + category		N	Adjusted for Factors and Covariates	Unadjusted	Adjusted for factors and Covariates	Eta	unadjusted	Beta
Treatment	Outdoor activities	120	17.37	17.37	0.317	0.127	0.322	0.129
	Conventional method	120	16.73	16.73	-0.317		-0.322	
Gender	Male	112	17.46	17.38	0.414	0.156	0.334	0.125
	Female	128	16.69	16.76	0.363		-0.292	
Location	Urban	120	17.88	17.80	0.833	0.335	0.755	0.303
	Rural	120	16.22	16.30	-0.833		-0.755	

A further clarification on Environmental Attitude using the Multiple Classification Analysis (MCA) on as shown in Table 3 revealed that the Experimental group had a higher unadjusted mean ($X= 17.37$) than the control group ($X= 16.73$). The treatment is observed to have contributed 1.7% to students' predisposition towards the environment.

Ho2: There is no significant main effect of gender on students' environmental attitude.

The results from table 2 reveals that there was a significant effect of gender on the environmental attitude of students ($F=6.939$, $P<0.05$). The hypothesis was therefore rejected. Table 3 shows that the male had higher environmental attitude mean score ($x=17.46$, $SD=2.434$) than the female students ($x=16.69$, $SD=2.496$). The males are therefore better positively disposed towards the environment than their female counterparts. Findings in Table 3 shows that gender accounted for 1.6% of the total variance in students' environmental attitude score as given by the Beta value of 0.125.

DISCUSSION. IMPLICATIONS AND RECOMMENDATIONS.

The results of the data analyzed reveal that outdoor educational activities had positive effects on the students' environmental attitude. The effect of outdoor activities on attitude was significant. This, in a way, was in the line with the findings of Olatundun (2008), Bookies (2004), Martin (2002), Stine (1997) and Knapp. (1996).

The study has provided the students with the opportunity to build attitudes based on their experience encountered in the environment. This approach towards solving environmental issues and problems is a step towards future sustainable development and brings about change in peoples' attitudes. This shows that the better we learn the better we realize the worth of our environment and the better should be our repertoire of behaviour towards the environment.

Gender, which is one of the moderator variables in this study, was investigated to know the effect it has on students' environmental attitude. The result of findings of analysis of data revealed that there was a significant main effect of gender on students' environmental attitude. The male students performed better than their female counterparts. This is in line with the findings of Gifford (1983), Have and Shayar (1981), Okpala and Onocha (1988) that showed a significant gender group difference (in favour of boy). This is opposed to the findings of Ogunleye (2002) and Olatundun (2008) whose researches revealed a significant gender group difference (in favour of the girls).

This finding further lends credence to the fact that the boys are more predisposed to the learning of science oriented subjects/topics than the girls.

The study was necessitated to find a way of bringing about functional and holistic environmental education and an all-round national development and systematic change, acquisition of attitude for utility, especially towards the environment, which has been observed to play a vital role in all facets of life.

The outdoor activity was seen to be effective in achieving this. Thus for students, it is expected they make maximum use of outdoor activities as an opportunity to improve upon their attitude

The following recommendations are made based on the findings of the study.

1. Curriculum Planners: The result of this study has shown the need for curriculum planners to include outdoor activity as one of the methods required in the curriculum, especially the student/teacher activities to bring about effective environmental attitude.

.2. Teachers and Students: Outdoor activities have been observed to have brought about significant attitudinal change in students. Therefore outdoor activities are recommended for teaching and learning of environmental education and even ecological topics in Biology.

REFERENCES

Adeyemi B.O and Ajogbeje O.O. (2006) Revitalizing decayed educational system through instructional technology. *African Journal of Historical Sciences in education* 2 (1): 40-51

Afuwape M.O (2003) Teacher and school factors as predictor of student's achievement in integrated science. *African Journal of Educate Research* 9 (1& 2): 89 – 96

Above Michael (2001) *Environmental management and education: An introduction* Second edition Lagos: Golden Pen Books

Above Michael (2001) *Environmental management and education: An introduction* Second edition Lagos: Golden Pen Books

Ajitoni S.O. (2005): Effects of full and quasi participatory learning strategies on senior secondary pupils' environmental knowledge and attitude in Kwara State Nigeria. *An unpublished Ph.D Thesis, Department of Teacher Education, University of Ibadan.*

Akubuilu D.U (2004) The Effects of Problem Solving Instructional Strategies on Students' Achievement and Retention in Biology with Respect to Location in Enugu State. *Journal of the Science Teachers Association of Nigeria* 39 (1& 2): 94-100.

Aremu A. & John A. (2005) Gender implications of the use of video drama in environmental education. *Issues in language, communication and education. A book in honour of Caroline A. Okedara. Dada A. Akinbade and O.O. Kolawole, Eds. Ibadan: Constellation books Pg 342-352*

Bilesanmi-Awodeni J.B. (2002) The Status of Biology Practical Skills Acquisition among Nigerian Secondary School Seniors in Ogun State. *African Journal of Educational Research* 8 (1 &2): 1-7.

Ogueri, A.C. (2004): The need for environmental education in secondary education level in Nigeria: Problems and challenges. Retrieved 28/01/2010 from http://rudar.ruc.dk/bitstream/1800/331/1/the_Need_for.pdf

Ogunleye, B.O. (2002): Evaluation of the Environmental Aspect of the senior secondary school chemistry curriculum in Ibadan. An unpublished PhD Thesis Department of Teacher Education, University of Ibadan.

Olatundun, S.A. (2008): Impact of Outdoor Educational Activities on pupils' Environmental Knowledge and Attitude in selected primary schools in Ibadan, Nigeria. An unpublished PhD Thesis. Department of Teacher Education, University of Ibadan.

Orenuga O.A. (2006) Optimization of Educational Resources: A move towards revitalizing Nigerian education. *African Journal of Historical sciences in Education* 2 (1): 208 – 214

Owoyemi T.E (2007) Mathematics & Chemistry Senior School Certificate Result, gender & attitude as predictors of achievement in a physical chemistry course. *African Journal of Education Research* 11 (1& 2): 27 – 34

Raimi S.M & Adeoye F.A. (2002) Gender differences among college Students as determinants of performance in integrated sciences. *African Journal of Educational Research*. 8(1 & 2): 41-49.

UNESCO-UNEP (1990) *International Environmental Education Programme on environmental education*: 1-21

Wikipedia – Constructivist teaching method. Retrieved May 11 2009 from http://en.wikipedia.org/wiki/constructivist_teaching_methods.