

PART D

1

**EFFECTS OF ENVIRONMENTAL RESOURCES ON
JUNIOR SECONDARY SCHOOLS BASIC SCIENCE STUDENTS
ACHIEVEMENT IN PANKSHIN L.G.A.OF PLATEAU STATE.**

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Abstract

This research work was designed to investigate the effects of environmental resources on students' achievement in Basic Science. A simple random sampling technique was employed to select 400 junior secondary school students from 8 secondary schools in Pankshin Local Government Area of Plateau State. The instrument used in gathering data for the study was Basic Science Achievement test (BSAT). Data collected was analyzed using independent t-test. The result showed that students taught using ecological garden performed better than those taught without ecological garden. The result also indicated that students in the small classroom size taught using ecological garden performed better than those in the large classroom size. Conclusions were drawn and recommendations were made among which was that teachers should teach concepts in Basic Science using environmental resources for better performance from students.

Keywords: Effects of environmental resources in science subjects, students' achievement in basic science subjects in school curriculum.

Introduction

The Environment is considered an important resources to man. The functions of the Environment primarily are to facilitate the teaching and learning of skills, facts, concepts, principles, generalizations, values and attitudes in Science. Environmental resources are therefore classified into human and community resources, these can further be grouped into science educators, teachers, technicians, medical doctors and researchers and also into factories, industries and companies which are located in the neighborhood of the schools

which provide very valuable resources to students for the teaching and learning of basic science. Beside industrial establishments, community resources like rivers, ponds forests, wildlife park, museum, hospitals and markets among others have major role to play in the teaching and learning of Basic science, (Coren, 2002).

According to (Farrant, 2002; Nneji 2007), the physical environment is seen as a powerful force in shaping children learning. Uduak and Inyang (2008) view science as the basis which empower students to obtain knowledge and harness it for their benefits. However, the environment is very crucial in teaching a core subject like basic Science, which involves the study of living and non – living component of the environment and how they relate and interact with each other.

Considering the poor academic performance between 50.12% - 58.40% of junior secondary schools students in Basic Science, (Duguryil 2011), it has been observed to be an issue of concern to parents, teachers and even the government. It is evident from literature that from the several investigations made, researchers have identified numerous possible factors responsible for the poor performance in our schools. Basic science is the study of living and non – living components of the environment which are best studied in their natural habitats. In teaching situation, the task of the Basic science teacher is to provide an enabling environment for students to learn through direct contact with nature, the teacher however, is to be an observer and a guide rather than being an instructor or custodian of knowledge. The basic science teacher is expected to assist the learner in the process through direct experiences on concrete objects rather than mere verbal instructions, (Sharma & Hyland, 1991; Uduak&Inyang, 2008). Therefore in teaching/learning, if there is a change in approach from the usual practice of verbal instructions from textbooks to a method where the learners are allowed to have direct contact with nature there might be an improvement in academic performance of students in Basic science.

(Etim, 2006; Nneji, 2007) supported that children should be allowed to have direct access with the environment in order to promote teaching - learning process and stated the following claims which facilitate the use of environmental resources in teaching;

- i. Environmental resources supply a concrete basis for conceptual thinking.
- ii. They also offer a reality of experience which stimulates self activity on the part of the students.
- iii. They supply necessary basis for the developmental learning hence make learning more permanent.
- iv. They provide high degree of interest for the students in the subject.

It is evident that, the number of students in a class differ from school to school, Ezewu. (2000) rightly observes that research has shown that interaction has positive influence on learning and vary according to the size of the groups. The class size should be what the teacher should manage effectively to bring about effective participation in learning Basic Science. The question is, do teachers incorporate these environmental resources in the planning and execution of their lessons delivery. The focus of this research work is to ascertain if environmental resources can influence students' performance using the concept of food chain. The class size with small number of student there is freedom, and individual recognition by the teachers, more effective relationship, effective control, class management and supervision as well as the greater and better performance in academic activities is always attained by the learners while teachers work loads are reduced (Pastella,

1996; Uduak&Inyang, 2008). Ekong (2001) also stated that students attain greater academic success when the number of learners per class is relatively small in size.

Statement of the Problem

Literatures have shown that, most Basic science teachers often use the laboratory and other teaching or instructional aids in the classroom as their main resources for teaching and learning. They hardly expose learner to real life experiences outside the classroom. On this account therefore, this study intends to find out the effect of environmental resources on Basic science students performance using the school ecological garden to teach food chain.

Purpose of the Study

The purpose of this study was to determine the effect of environmental resources on Basic Science students' performance in junior secondary schools in Plateau State. Specifically, the study will attempt to:

- i. Compare the performance of Basic Science Students in food chain taught using ecological garden in the school and those taught without ecological garden.
- ii. To compare the performance of Basic Science students taught in large class and those taught in small class size.

Research Questions

To guide this study, the following research questions are stated:

- i. What differences exist between the performance of Basic Science Students taught using ecological garden and those taught without ecological garden?
- ii. What differences exist between the performance of Basic Science Students in large and small class sizes taught using ecological garden?

Research Hypotheses

In order to guide the study and to achieve the purpose of this study, the following null hypotheses were formulated;

Ho₁: There is no significant difference in the performance of Basic Science students taught using ecological garden and those taught without ecological garden.

Ho₂: There is no significant difference between the performance of students in large and small class sizes taught with ecological garden.

Significance of the study

By the end of this study, teachers will be provided with a better understanding of using environmental resources to teaching Basic Science concepts in the classroom teaching/learning situation.

Methodology

Population, Sample and Sampling Technique

This study embarked on a survey design and conducted in junior secondary schools in Pankshin Local Government Area of Plateau State. The study comprises of JSS3 students in fifteen public junior secondary schools in Pankshin L.G.A. of Plateau State. A total of 850 students in the 2013/2014 academic session formed the population of the study. This sample

consist of 400 JSS 3 Basic Science students. The Criterion Sampling method was used to select two schools from four district of Pankshin making a total of eight schools for the study. Simple random sampling technique was adopted in selecting 50 JSS 3 Basic Science students from each of the to eight schools.

Instrument for data collection

The instrument used for this study is a Structured Basic Science Achievement Test (BSAT). The instrument was a 20 item multiple choice questions with options A to E and was based on the concept of food chain in Basic Science.

The instrument (BAST) was validated by science educators in the department of Science and Technology Education, University of Jos. The items where scored on the Basic Science Achievement Test which carries 5 marks each.

Research Procedure.

In this study, in order to collect the required information, the researchers visited the eight sampled schools. Foursecondary schools served as experimental group and four schools also served as control group. 200 students were taught the concept of food chain in Basic Science using ecological garden and another 200 students were taught the same concept without ecological garden. The researchers taught the students themselves and for 40 minutes. The control and experimental groups were not allowed to interact with themselves.

The large class size consisted of 140 students while the small class size consisted of 60 students. The experimental group were exposed to 3 weeks of teaching on the concept of food chain using the ecological garden while the control group were exposed to 3 weeks of teaching on the same concept of food chain without ecological garden. At the expiration of 3 weeks, Basic Science Achievement Test (BSAT) was administered to the two groups. Data collected were used for analysis.

Method of data analysis

The data collected were analyzed using independent t-test statistics at 0.05 level of significance.

Results.

Result of the study are presented in line with the research questions and hypothesis as follows:

Research question one

What difference exist between the performance of Basic science students taught using ecological garden and those taught without ecological garden?

Table 1: Differences that exist in the performance of Basic science students taught using ecological garden and those taught without.

Difference	Number of students	Percentage number of students
Students taught with ecological garden perform excellently better.	300	75%
Students taught without ecological garden perform poor.	100	25%

Table 1 shows that 75% of the student agreed that the 100 students taught with ecological garden performed excellently better while 25% agreed that students who were taught using ecological garden performed poor. This is as a result of direct contact with the environment by the students.

Research Question Two:

What differences exist between the performance of Basic science students in a large and small class taught with ecological garden.

Table 2: Differences that exist between the performance of Basic Science student in large and small class taught with ecological garden.

Difference	Number of students	Percentage number of students
Better performance with small class.	2.50	62.5
Poor performance with large class	150	37.5

Table 2: Shows that 62.5% of the students agreed that small class size encourages high (better) performance while 37.5% of them agreed that large class size brings about poor performance. This is because the teacher could manage the small class very well.

Hypothesis 1: States that, there is no significant difference in the performance of students taught with ecological garden and those taught without ecological garden using the concept of food chain.

The hypothesis was tested by computing all the scores of the students from schools taught using food chain with ecological garden and those taught without. The result is as shown in table 1:

Table 1: t-test of Basic Science students' performance taught food chain with ecological garden and without.

Variable	N	\bar{x}	Sd	df	t-cal	t-cri
Students taught with ecological garden	100	61.47	15.00	197	3.48	1.961
students taught without ecological garden	100	53.83	16.01			

From table 1, it is glaring that, the calculated value of t is 3.48 which is greater than the critical value which is 1.961 at 0.05 level of significance. The H_{01} was rejected. This implies that, students taught with ecological garden performed better than students taught without ecological garden.

Hypothesis 2: States that there is no significant difference in the performance of students in large and small class size taught food chain with ecological garden. This hypothesis was tested by computing all the scores of the students in large and small class sizes taught with ecological garden.

Table 2: t -test of Basic Science students' performance in large and small class sizes taught with ecological garden.

Variable	n	\bar{x}	sd	df	t-cal	t-cri
Large class size taught ecological garden	70	46.50	10.43	97	8.20	1.96
Small class size taught ecological garden	30	65.68	12.77			

From table 2, it is observed that the calculated value of t is 8.20 which is greater than the critical value which is 1.96 at 0.05 level of significance. The H_0 was rejected. This means that students taught in small class size performed better than students taught in a large class size.

Discussion

Based on the null hypothesis (H_0) which states that there is no significant difference in the performance of students taught using ecological garden in Basic Science, the data collected was subjected to analysis and the result indicated that those students taught with ecological garden performed better than those taught without ecological garden. This was observed in the mean scores of 61.47 for those taught with ecological garden and 53.83 for those taught without ecological garden. The t-cal value of 3.48 and 1.961 for t-cri led to the rejection of the hypothesis. This result is in agreement with Sharma and Hyland (1991) and Uduak and Iyang (2008) who found out that students exposed to direct experience on concrete objects performed better than those exposed to only verbal instructions. It also agrees with Farrant (2002) and Nneji (2007) who viewed the physical environment as a powerful force for shaping a child's learning outcome.

H_0 states that there is no significant difference in the performance of students in large and small classes taught the concept of food chain with ecological garden. Similarly, the data collected was subjected to analysis and the result indicated that students in the small class size performed better than those in the large class size. This was observed in the mean scores of 46.50 for those in the large class and 65.68 for those in the small class. The t-cal of 8.20 and t-cri of 1.96 led to the rejection of the null hypothesis. This result therefore agrees with the work of Ekong (2001) who stated that students attain greater academic success when the number of the students per class is small. The study also agrees with the work of Pastella (1996) and Uduak and Inyang (2008) who found out that the class with small number can easily be managed and supervised hence produces better academic performance.

Conclusion

Based on the research findings, the researchers which to conclude that environmental resources and classroom size have a significant influence on students achievement. Therefore teachers should make use of resources in the environment for effective teaching and learning.

Recommendations

From the findings of this study, the following recommendations are necessary:

- (i). That teachers should endeavour to teach concepts in Basic Science using environmental resources.
- (ii). The government should ensure that basic science classes should have students/teachers ratio of 30:1 for effective management and control.
- (iii). The government should also ensure that our secondary schools classrooms should not be overcrowded.

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