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THE INFLUENCE OF ENVIRONMENTAL RESOURCES ON STUDENTS PERFORMANCE IN BIOLOGY

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ABSTRACT

This study was designed to investigate the influence of environmental resources on students performance in Biology. It adopted the use of simple random sampling technique to select one hundred and sixty (160) senior secondary one (SS1) students from four (4) secondary schools in Matazu Local Government Area of Katsina State. Biology Achievement Test (BAT) was used as an instrument to gather the data for study. Similarly, independent t-test was used to analyzed the data collected. The results showed that students taught using ecological garden performed significantly better than those students taught without ecological garden. It has also been observed that students in a small class size taught using ecological garden performed significantly better than those students in the large class size. Based on that, conclusions were drawn and recommendations were made among which include teachers should teach concepts in biology using environmental resources for better performance.

Introduction

Environment is the natural world in which people, animals and plants live. Thus environmental resources are those resources that are naturally found in the environment. According to Edet & Glory (2008) environmental resources are those resources whose major functions are to facilitate the teaching and learning of skills, concepts, facts, principles, values and attitudes in sciences. It could be deduced therefore that environmental resources are classified into human resources and

community resources. The human resources include the teachers, technicians, doctors, educationists etc, while the community resources include: the factories, industries, companies which are located in the neighbourhood of the schools which provide very valuable resources for teaching and learning of biology. Coren, (2002) agued that industrial establishments, community resources like forests, ponds, rivers, seas, oceans, market, wildlife park, museum among others have major role in the teaching and learning of biology.

Farrant (1981) considered the physical environment as a powerful force that can be used in shaping child's ability of learning. Okeke (2007) viewed science as the study of the environment, hence while teaching, students must be empowered to obtain knowledge and harness it for their benefits. This is very crucial in teaching subject like biology which involves the study of plants and animals and how they interact with their living and non living environments.

In present day, the academic performance of secondary school students in science subjects and biology in particular has been an issue of concern to parents, teachers and even the government. Studies carried out by various researchers have identified numerous possible factors responsible for this state of affairs. Biology has been defined as the study of living things, hence living things are best studied in their natural habitats. In this regards, therefore, the task of biology teachers is to provide an ideal environment for students to learn in direct contact with nature. Wasagu (2007), pointed out that a teacher is to be an observer and a guide to the students rather than being an authoritarian instructor or custodian of knowledge. Sharma & Hyland (1991), earlier on argued that teachers should assist the students to learn through direct experiences on concrete objects rather than learning through mere verbal instructions. It appears therefore that if there is a shift in the approach of teaching from the usual practice of verbal instructions from text books to a method where the students are allowed to learn by direct contact with nature, there might be an improvement in the academic performance of students in Biology

Environmental resources are considered as an integral part of teaching and learning process, hence Etim (2006), enumerated the following claims which support the use of environmental resources in teaching;

- Environmental resources provide high degree of interest for the students in the subject.
- Environmental resources supply a concrete basis for conceptual thinking.

- Environmental resources offer a reality of experience which stimulates self activity on the part of the student.
- Environmental resources supply necessary basis for the developmental learning, hence make learning more permanent.

It is generally agreed that the numbers of students differ from school to school; hence Ezewu (1987) argued that interaction influence on learning vary according to the size of the groups. Edet & Glory (2008) also pointed out that class size should be what the teacher can manage effectively to bring about effective participation in learning biology. Now the question here is, do teachers incorporate these environmental resources in the planning and execution of their lessons? The focus of this study therefore is to ascertain if environmental resources can positively influence students' performance in the concept of food chain. The class with small enrolment makes for better and greater freedom, individual recognition by teachers, more effective relationship, effective control and class management/class supervision as well as the greater and better performance in academic activities is attained by students while teachers work loads are reduced (Pastella, 1996). This views agrees with that of Ekong (2001) who stated that students attain greater academic achievement when the number of students per class is small.

Statement of the problem

Laboratories and other teaching aids are commonly used by most biology teachers as their main resources for teaching and learning. Teachers rarely expose students to real life experiences outside the classroom. Therefore this study seeks to find out the influence of environmental resources on biology students performance using ecological garden to teach the concept of food chain.

Purpose of the study

The purpose of this study is to determine the influence of environmental resources on the academic achievement of biology students in senior secondary schools in Ktsina State. In a more clear terms, the study attempts to:

a. compare the performance of biology students in food chain taught using ecological garden and those taught without ecological garden.
b. Compare the performance of biology students taught with large class size and those taught with small class size.

Research Questions

The following research questions are posed to guide the study.

a. Is there any significant differences between the performance of biology students taught food chain using ecological garden and those taught without ecological garden?
b. Is there any significant differences between the performance of biology students in large and small class sizes taught food chain using ecological garden?

Research Hypotheses

The following null hypotheses were formulated in order to guide this study and to achieve its purpose.

Ho_1: There is no significant difference between the performance of biology students taught using ecological garden and those taught without ecological garden.

Ho_2: There is no significant difference between the performance of students in large and small class sizes taught with ecological garden.

Significance of the study

The research outcome will serve as a comprehensive information that will expose science teachers in general and biology teachers in particular on the importance of environmental resources to the teaching and learning of biology concepts.

Methodology

Design of the study

The design used to carryout this study was a descriptive survey.

Area of the study

The research study was conducted in senior secondary schools in Matazu Local Government Area of Katsina state.

Population of the study

The target population for the study was all the senior secondary one (SSI) students in all the public secondary schools in Matazu Local Government Area. A total of 976 SSI students in 2008/2009 academic session formed the population for the study.

Sample/sampling Technique

The sample for this study consisted of one hundred and sixty (160) senior secondary one (SSI) students. The criterion sampling technique was used to select four schools for the study. Simple random sampling technique was used to select fourty (40) SSI biology students form each of the four schools.

Research instrument

Biology Achievement Test (BAT) was used as an instrument of generating data. It was a 25 item multiple choice questions with options A to D. the questions were based on the concept of food chain in biology.

Validity and Reliability of the instrument

The instrument was validated by experts from Science and Vocational Education Unit, Usmanu Danfodiyo University Sokoto and also experts from School of Science, Federal College of Education, katsina. A split-half reliability coefficient was adopted and a value of 0.83 was obtained. This value was considered sufficiently high to confirm the reliability of the instrument.

Scoring of the instrument

Each item on the Biology Achievement Test (BAT) carried 4 marks.

Research procedure.

The researcher visited each of the four schools in order to collect the required information for the study. Out of the four schools used for this study, two schools served as experimental group while the remaining two schools served as control group. Eighty (80) students were taught the concept of food chain in biology using ecological garden and another eighty (80) students were taught the same concept without ecological garden.

The large class size consisted of fifty (50) students while the small class size consisted of thirty (30) students. Both the experimental and control groups were exposed to four (4) weeks of teaching on the concept of food chain with and without ecological garden respectively. At the end of the treatment, Biology Achievement Test (BAT) was administered to the two groups and data collected were used for the analysis.

Method of Data Analysis

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

Results

Ho_1: There is no significant difference between the performance of biology students taught food chain with ecological garden and the those taught without ecological garden.

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

Table 1: Difference in the performance of biology students taught with ecological garden and those taught without ecological garden.

Variable	N	Mean (X)	SD	Df	t_{cal}	t_{crit}	Sig-level
Taught with ecological garden	80	46.63	12.88	158	611	1.96	0.05
Taught without ecological garden	80	40.15	9.80				

Significant at 0.05 level of significance

From table 1 above, it is observed that the t-value calculated (6.11) is greater than the t-value critical (1.96) at 0.05 level of significance. This indicated that there is statistically significant difference between students taught with ecological garden and those taught without ecological garden. Hence the HO_1 was rejected.

Ho_2: There is no significant difference between the performance of students in large and small class sizes taught with ecological garden.

This HO was tested by computing all the scores of the students in large and small class sizes taught with ecological garden. The result is shown in table 2 below.

Table II. Difference in the performance of biology students in large and small class sizes taught with ecological garden.

Variable	N	Mean (X)	SD	Df	t_{cal}	t_{crit}	Sig-level
Large class size with ecological garden	50	58.05	13.48	78	5.13	1.98	0.05
Small class size with ecological garden	30	52.63	11.52				

Significant at 0.05 level of significance .

From the table II above, it is observed that the t-value calculated (5.13) is greater than the t-value critical (1.98) at 0.05 level of significance. This showed that students taught in a small class size performed significantly better than students taught in a large class size. Hence Ho_2 was rejected.

Discussion of result

Ho_1, which states that there is no significant difference between the performance of biology students taught with ecological garden and those taught without ecological garden was subjected to t-test analysis and the result indicated that those taught with ecological garden performed better than those taught without ecological garden. This was observed in the mean scores of 46.63 for students taught with ecological garden and 40.15 for those taught without ecological garden. The t-value calculated of 6.11 which is greater than the t-value critical of 1.96 led to the rejection of the null hypothesis. This result is in agreement with the submission of Sharma & Hyland (1991) who found out that students exposed to direct experience on concrete objects performed better than those exposed to verbal instruction. The result also agreed with the opinion of Farrant (2002) who viewed physical environment as a powerful force for shaping a child's learning.

Ho_2 stated there is no significant difference between the performance of students in large and small class sizes taught with ecological garden.

The H_o was subjected to t-test analysis and the result showed that students in the small class size performed better than those in the large class size. This was observed with the t-value calculated of 5.13 which is greater than the t-value critical of 1.98 at 0.05 level of significance. Hence the Ho was rejected. This result is in agreement with the finding of Ekong (2001) who find out that students attained greatest academic achievement when the number of the students per class is small. The result also agreed with the work of pastella (1996) who found out that the class with small enrolment makes for better and greater freedom, more effective relationship, effective control and class management as well as greater and better academic performance is attained by students.

Conclusion

From the findings of this study, it was concluded that environmental resources and small class size have a significant positive influence on students academic performance.

Recommendations

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

a. That environmental resources should be used by teachers to teach biological concepts.
b. That government and schools management should make sure that 1:30 ratio has been adhere to.
c. Government and school management should make sure that secondary schools are not overcrowded. To achieve this, the following should be adhere to:
    i. Schools management should avoid admitting too many students.
    ii. Since education is a right and not a privilege to all Nigerian children, government should build more schools and equip them with both human and materials resources to cater effectively and comfortably for all Nigerian children.

REFERENCES

Coren, S. G. (2002): *School Environment and Learning.* Washington D.C. Retrieved April 4th, 2009 from httpLwww.eduenviron.org /pubs/ environment soruces.html.

Edet U. B. & Glory, J. I. (2008): *Effect of Environmental Resources on Students Achievement in Biology.* 49 Annual conference proceedings of STAN.

Ekong, I. E. (2001): *Health School Environmental.* A critical factor for the implementation of Universal Basic Education in Nigeria. International Journal of Educational Development (IJED). AAVEN publications.

Etim, P. J. (2006): *Issues in Educational Technology*: A monogrophy Uyo. Cle-printers.

Ezewu, E. E (1987): *The map of social psychological factors of human learning in schools.* Onitsha. Lead way books ltd.

Farrant, S. S. (1981): *Principles and practice of Education.* London. Morison and Gib Ltd.

Okeke, E. A. (2007): *Making science Education Accessible to All.* 23rd Inaugural lecture of the University of Nigeria, Nsukka. 9th August.

Olarewaju, A. O. (1994): *New Approaches to the Teaching of Integrated science*, Ibadan, Alfas Nigeria company.

Pastella, M. (1996): The effect of class size on the Achievement of Different Ability Groups in Mathematics. *Journal of Science Teachers Association of Nigeria.* Pp. 72 - 75.

Sharma, A. P. & Hyland, J. T. (1991): *Philosophy of Education for Nigeria.* Kaduna: Gbabeks publishers limited.

Wasagu, M. A. (2007): Functional Science, Technology and Mathematics Education for National economic improvement and development. *Nigerian Journal of Research*, 1 (1): 77 - 78.