
EFFECT OF OUTDOOR LEARNING METHOD ON THE ATTITUDE AND PERFORMANCE OF BIOLOGY SECONDARY SCHOOL STUDENTS IN OBIO/AKPOR, RIVERS STATE.

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Abstract

This study investigated effect of Outdoor Learning Strategy on the Attitude and Performance of Biology Secondary School Two Students in Obio/Akpor, Rivers State. This study adopted a quasi-experimental pre-test, post-test and descriptive survey design involving a sample of 133 Biology students from a population of 12,606 students selected through purposive sampling from two schools. Two research questions and two hypotheses guided the study. And the research instruments used for the study are Biology Performance Test (BPT) used to obtain the pre- test and post- test mean score performance and Biology Students Outdoor Learning Attitude Questionnaire (BSOLAQ) that was used to assess the students' attitudes towards learning outside the classroom. The topic taught is on Ecology. The instruments were validated for content and construct by expert in Biology from University of Port Harcourt. The reliability coefficient of the research instruments are 0.70 and 0.83 obtained using the Kuder-Richardson-21 (KR-21) and Cronbach Alpha methods respectively. Mean and Standard Deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) and t-test were used to test the hypotheses at 0.05 level of significance. The findings of this study showed that the students taught using Outdoor Learning Strategies demonstrated improvements in performance and there was also a positive significant impact on the students' attitude towards learning Biology. Recommendations among others were made that schools should incorporate Outdoor learning strategies into Biology curricula to enhance students' engagement and outcomes.

Keywords: Outdoor Learning Method, Attitude and Performance

Introduction

The number of students taking Biology classes has grown since the subject is required at all levels of high school. Consequently, educational experts are always exploring new approaches to educate in order to help students better understand and internalise abstract ideas. There are several benefits for both students and teachers when lessons and learning take place in non-traditional settings. Creating mental pictures of lessons and remembering what you've learned might be aided by outdoor learning's emphasis on experiencing encounters. Outdoor education is a cornerstone of environmental education, responsible citizenship, and sustainable development, according to one study by (O'Neil et al., 2024). Traditional teacher-centered methods of education are giving way to more student-centered approaches (Kuok & Daniel, 2023).

The academic merit of nature-based learning has been investigated on a national scale, and it is hard to exaggerate the role that natural settings play in children's social and personal identity development. Research has shown that children's emotional and physical health improve when they spend time in nature (Mann et al., 2022). Humans and their environment have coexisted since the beginning of recorded history. People have relied on environmental cues for a long time to distinguish between safe and dangerous foods, choose the best times to grow crops, and harness their energies (United Nations, 2023). The Sustainable Development Goals (SDGs) place an emphasis on education as a means to preserve cultural heritage, the environment, and sustainable resources.

In today's world, education and health may both benefit from outdoor learning (Bollin et al., 2021). Research has shown that spending time in nature has positive effects on health and happiness. Children develop physically, mentally, and socially by exposure to the outdoors, which also benefits their health. Knowing how to implement outdoor education is vital for enjoying all of its advantages (Kiviranta et al., 2024). Learning may be either difficult or fun depending on the students' attitude, which is a major factor in most learning situations (Okey & Avwiri, 2012).

An attitude is defined as a continuous favourable or negative judgement of things, people, or ideas by the American Psychological Association (APA, 2018). Beliefs and sentiments shape prior actions and attitudes, which in turn impact relationships on both an individual and societal level. Based on their surroundings, classmates, and learning materials, students' attitudes may be improved via meaningful experiences in the classroom.

An optimistic outlook fosters a motivating and encouraging setting for learning, which in turn boosts self-assurance and intrinsic drive. Both intellectual ability and the learning process are aspects of academic performance that are significantly impacted by one's attitude towards learning. Students' opinions regarding their own academic achievement, their teachers, and the institution as a whole significantly impact their academic outcomes (Donald, 2021).

A student's attitude shapes their views of learning, their ideas, their choices, and their life trajectory. In most cases, curiosity and a desire to do things on one's own are the driving forces behind this kind of intrinsic drive. To foster the growth of such attitudes, it is crucial to provide an accommodating setting for learning. Students are able to tap into their innate wanderlust via outdoor education. Participation in the extracurricular activity may enhance engagement and retention of information (Claiborne et al., 2020). According to Avwiri and Dike (2020), the way a teacher approaches teaching and learning may have a significant

impact on students' attitudes towards the subject matter. Since the main goal of education is to improve students' knowledge and skills over the long run, teaching should focus on making that goal attainable.

The key to effective teaching is ensuring that students acquire information and abilities that can be applied to several contexts, rather of being limited to just one. This process helps in both remembering things and passing them on to others. The visible behaviours that occur during or shortly after learning, known as instructional performance, may not always indicate long-term learning. However, changes in behaviour and understanding that persist long after the learning process ends are the hallmarks of true learning. One way is the lecture style, where the instructor primarily uses words to communicate the material to the class. Students often sit and write during this method (Nwanekezi et al., 2023). Whether in a classroom or on the job, educators should strive to provide pupils information that will last a lifetime and be applicable in a variety of contexts. Students' ability to recall and apply information in novel circumstances will improve with such adaptability.

The idea behind outdoor learning is that it provides students with real-life experiences that will help them retain more information and be more adaptable. According to Kuok and Daniel (2023), active learning strategies are becoming more important since student-oriented approaches are also on the increase. According to Asghar's (2020) research, students' positive attitudes toward science education can be enhanced by implementing outdoor learning environments. The majority of students surveyed found that these alternatives to traditional classroom instruction were more engaging, fun, and conducive to the acquisition of novel concepts. The shift in perspective is significant because it stresses the need for engaging classrooms as a means of getting students to actively engage with and retain information. In a similar vein, Wan et al. (2011) found that students' focus and enthusiasm for learning improved when they learned outdoors.

The importance of a welcoming and comfortable learning environment was highlighted, as it contributes to higher levels of satisfaction and better learning outcomes. Their findings further support the idea that integrating the system might improve students' focus, happiness, and performance in the classroom by allowing them to adapt to the outside learning environment.

The significance of an interactive and student-centered approach to education in improving academic performance was also emphasised in the research by Isa et al. (2020). Findings from this study provide credence to the theory that Place-Based Outdoor Learning (PBOL) not only improves students' academic outcomes, but also plays a crucial role in shaping their perspective on Biology. This method offers a great alternative to the traditional classroom approach to teaching Biology by making the learning process more engaging, interesting, and conducive to good behavioural change for students.

Students' attitudes toward science may be improved by place-based outdoor learning, according to Simmons et al. (2020). This is because students gain curiosity, motivation, and enjoyment from the experience. According to their findings, students find science and Biology more engaging and accessible when they participate in learning activities outside of the classroom. Similarly, Santos et al. (2020) conducted study that shown how outdoor learning activities significantly improved students' attitudes towards Biology. From what they could tell, participating in these activities not only improved their understanding of biological ideas and processes, but also sparked more curiosity, motivation, and self-efficacy. Outdoor

learning has the potential to alter students' perspectives and pique their interest in the topic, according to their quasi-experimental research.

Additionally, place-based education has been shown to be beneficial according to Taylor et al. (2021), who found that students' interest, motivation, and perceived relevance of the subject matter were all favourably affected by these educational experiences, leading to a more favourable attitude towards science. The fact that children found outdoor learning activities more interesting and rewarding was another perk that educators saw, and it helped create a more pleasant atmosphere in the classroom. Outdoor learning was beneficial in terms of both student attitude and scientific performance, as measured by standardised assessments (Zhang et al., 2023).

Statement of the Problem

In our Nigerian school, we are worried about the students' lacklustre performance in scientific classes. With Biology as no exception and the inability to supply or create topic-related materials, depending on the kind of school, and a lack of instructional materials and abilities necessary for successful teaching are among the numerous reasons that have been proposed as explanations. This, in turn, may impact students' attitudes toward learning. The goal of learning outside the classroom is to provide educators with the knowledge and skills they need to effectively integrate and impact meaningful outdoor learning experiences into their daily lessons, regardless of the setting or the demographics of their students. Is it possible that including extracurricular activities into secondary school curricula might help students' attitude, academic achievement, and behaviour? Consequently, this study's primary objective is to determine if Outdoor Learning, an activity-based and student-centered approach to education, significantly impacts students' performance and attitude.

Aim and Objectives of the Study

This research aims to examine how secondary school Biology students in the Obio/Akpor Local Government Area of Rivers State fare when exposed to outdoor learning environments. The specific objectives were to:

1. determine the difference in the mean scores performance of Biology secondary school students taught Ecological concepts using Outdoor Learning method and those taught using lecture method.
2. examine the difference in the attitude of students taught using outdoor learning method and those taught with the lecture method.

Research Questions:

1. What is the difference in the mean scores performance of Biology secondary school students taught Ecological concepts using Outdoor Learning method and those taught using lecture method ?
2. What is the difference in the attitude of Biology secondary school students taught using outdoor learning method and those taught with the lecture method?

Hypotheses

1. There is no statistically significant difference in the mean performance scores of Biology secondary school students taught Ecological concepts using Outdoor Learning method and those taught using lecture method.

2. There is no statistically significant difference in the attitude of Biology secondary school students taught using outdoor learning method and those taught using lecture method.

Area of the study

Students in the Obio/Akpor Local Government Area of Rivers State's Senior Secondary School 2 (SSS2) Biology program are the subjects of this study. Students of biology were taught the fundamentals of ecology in class. The educational approaches include ecological outdoor activities and lectures. The Obio/Akpor Local Government Area is located in the Port Harcourt metropolitan area at these coordinates: 04deg45'0" and 07deg01'0". According to the 2006 census, its size is 200 km² and its population is at 4,64,789. Both government and privately held universities and businesses may be found in the area. People that work for the local government are mostly involved in the business world, fishing, or farming.

Methodology

A total of 133 students were selected at random from a pool of 12,606 using a purposive selection strategy; the research designs used in this study were descriptive survey and quasi-experimental. The Biology Students Outdoor Learning Attitude Questionnaire and the Biology Performance Test (BPT) were the two research tools used in the study. The BPT was utilised to determine the mean score performance before and after the test. (BSOLAQ) that used a modified Likert scale to evaluate students' perspectives on learning outside the classroom. Ecological principles are covered in class. An expert in biology from the University of Port Harcourt verified the instruments for both content and build. The research tools had reliability coefficients of 0.70 and 0.83, respectively, as determined by the Kuder-Richardson-21 (KR-21) and Cronbach's Alpha. Results for both the pre- and post-tests were based on 30-item questions taken from previous West African Examination Council (WAEC) and National Examination Council (NECO) exams. The BPT test had a total of 30 points, with 1 point deducted for each incorrect response and 0 points for each right one. To address the study topics, we used descriptive statistics such as mean and standard deviation. To evaluate our hypotheses, we employed t-test and ANCOVA (Analysis of Covariance).

Results

Research Question 1: What is the difference in the mean scores performance of Biology secondary school students taught ecological concepts using Outdoor Learning method and those taught using lecture method.

Table 1: Mean and Standard deviation of the performance of Biology students taught using outdoor learning method and those taught using lecture method.

Method		Pretest	Posttest	Mean Gain
Lecture method	Mean	13.29	19.43	6.14
	N	70	70	
	Std. Deviation	3.60	3.42	
Outdoor Learning	Mean	14.97	21.13	6.19
	N	63	63	
	Std. Deviation	5.38	4.67	

Table 1 shows that the control group averaged 13.29 on the pretest and 19.43 on the posttest, whereas the experimental group averaged 14.97 and 21.13. In addition, the experimental

group had a main gain of 6.19 after the test, whereas the control group had a gain of 6.14. This indicates that students' performance improved while using either the lecture or place-based outdoor learning approach, with the latter showing a somewhat larger mean improvement. The standard deviations also show that the two groups' results vary somewhat differently, with the place-based outdoor learning group having somewhat more variability than the lecture group.

Research Question 2: What is the difference in the attitude of Biology secondary school students taught using outdoor learning method and those taught with the lecture method?

Table 2: Mean and Standard Deviation of the effect in the attitude of Biology students taught with outdoor learning method and those taught with lecture method.

Method	N	Mean	Std. Deviation
Outdoor Learning	63	3.05	0.40
Lecture Method	70	2.69	0.71

In Table 2, we can see the results of comparing the Outdoor Learning technique with the Lecture method in terms of the average and standard deviation of the students' attitudes towards biology in secondary school. $M = 3.05$ ($SD = 0.40$), the higher mean score, shows that pupils had a more positive attitude while using the Outdoor Learning approach. The Lecture Method, on the other hand, produced a less favourable attitude-inducing mean score of 2.69 ($M = 2.69$), which is marginally more than the criteria mean of 2.5 ($SD = 0.71$). Based on these results, it seems that the PBOL approach might work better to get secondary school kids excited about Biology.

Hypothesis 1: There is no statistically significant difference in the mean performance scores of Biology secondary school students taught ecological concepts using Outdoor Learning and those taught using lecture method.

Table 3: Summary of Analysis of Covariance of the difference in the mean performance scores of Biology students taught using outdoor learning strategy and those taught using lecture method.

Dependent Variable: Posttest

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2025.556 ^a	2	1012.778	559.651	0.000	.896
Intercept	848.051	1	848.051	468.625	0.000	.783
Pretest	1926.300	1	1926.300	1064.455	0.000	.891
Method	2.987	1	2.987	1.651	0.201	.013
Error	235.256	130	1.810			
Total	56789.000	133				
Corrected Total	2260.812	132				

a. R Squared = .896 (Adjusted R Squared = .894)

The impact of Outdoor Learning on the performance of secondary school pupils in Biology is shown in Table 3 with an F-value of $F_{1,130} = 1.651$, $p = 0.201$ ($p > 0.05$) and a partial eta

squared of 0.013. By keeping the null hypothesis in place, we can see that the mean scores of students taught in a lecture-based vs an outdoor-based setting do not vary significantly.

Hypothesis 2: There is no statistically significant difference in the attitude of Biology secondary school students taught using outdoor learning method and those taught using lecture method.

Table 4: t-test analysis on the difference in the attitude of Biology students taught using outdoor learning method and those taught using lecture method

Methods	n	$\bar{x}$	SD	df	P-value	t-cal	Remark
PBOL	63	3.05	0.40	131	0.001	3.578	Ho reject
LM	70	2.69	0.71				

Table 4 shows how secondary school students felt about Biology classes taught either via the lecture method or through outdoor learning. Exposure to the outdoor technique increased students' favourable attitudes toward biology, as shown by a higher mean attitude score (mean = 3.05, SD = 0.40, n = 63). On the other hand, the LM produced a less favourable attitude score (mean = 2.69, SD = 0.71, n = 70), suggesting a less well-rounded perspective. The null hypothesis (H_0) was rejected due to statistical analysis, which yielded a t-calculated value of 3.578 with 131 degrees of freedom and a significant p-value of 0.001 ($p < 0.05$). Students' attitudes toward biology were much enhanced by the Outdoor technique compared to the Lecture method.

Discussion of Findings

The findings revealed that teaching ecology through outdoor learning had a significantly positive effect on the academic performance of secondary school students, outperforming the lecture method by a small margin. Outdoor learning spaces have a beneficial effect on students' attitudes and academic achievement because they are student-centered, fun, and engaging. The importance of attitude in creating stimulating classroom settings, inspiring students to take an active role, and improving their ability to remember information is also a factor. This is in line with what Asghar (2020) found: that students' attitudes toward scientific learning are improved in outdoor learning spaces. Similar to what Wan et al. (2011) and Zhang et al. (2023) found, outdoor learning increases students' focus and interest in their studies, which in turn boosts their academic achievement. Furthermore, Isa et al. (2020) highlighted the significance of student-centered and participatory pedagogical approaches in enhancing academic achievement. Nevertheless, the approaches employed were not significantly different. Possible explanation: Place Based Outdoor Learning yielded just a moderate improvement over traditional lecture methods.

Also, there is a substantial difference in attitude between students taught using the Lecture technique and those taught with Place-Based Outdoor Learning, rejecting the null hypothesis in the process, which agrees with the works of Simmons et al. (2020) and Santos et al. (2020) indicating that students' attitudes about Biology were much enhanced by outdoor learning activities. Taylor et al. (2021) emphasised that students' attitudes toward science were favourably affected by these educational experiences, which increased interest, motivation, and the perceived relevance of the topic. This provided evidence for the success of the Place-Based Outdoor technique. Supplementing these results, Zhang et al. (2023)

demonstrated that students' attitudes and scientific success, including standardised exam scores, were positively impacted by outdoor learning.

Conclusions

This study looked at how Biology classes in Rivers State's secondary schools taught the topic of ecology using both outdoor learning and more conventional lecture approaches. The results show that secondary school students' performance and attitudes in Biology are both improved when they use Outdoor Learning strategies. Outdoor learning techniques significantly boost student performance and develop more positive attitudes, but the lecture style continues to be successful.

Recommendations

The following suggestions were based on the study results.

1. Integrating outdoor learning approaches into Biology courses may increase student engagement and enhance learning results.
2. Training educators in outdoor learning methods is essential for successful implementation.
3. Future study should investigate the long-term impact of outdoor learning on students' performance and attitudes in many geographic and cultural situations.

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