Lagos Journal of Contemporary Studies in Education
ISSN: 3043-9075 E-ISSN: 3043-6834
Volume 2, Issue 2, July 2024, 258-266
DOI :https://doi.org/10.36349/lajocse.2024.v02i02.19

EFFECT OF EXPERIENTIAL LEARNING STRATEGY ON BIOLOGY SENIOR SECONDARY SCHOOLSTUDENTS' ACADEMIC PERFORMANCE IN OGUN STATE, NIGERIA

OGUNLEYE Abayomi Taiwo (PhD)
Department of Biology, Federal College of Education Abeokuta,
Osiele Ogun state. abayomiogunleye85@gmail.com 08063169766

Abstract

The research considered the effects of experiential learning strategy on students' academic performance in biology in Ogun state. The investigation was carried out by pretest and posttest quasi-experimental research design. The population involved were all students in Ogun State senior secondary school and 89 students from two intact classes of senior secondary school I which were purposively selected in Odeda local government participated in the study. Data was collected by using a performance test in Biology as an instrument and its Reliability was done using KR-20 and the coefficient value of 0.8 was established. The hypotheses were tested using ANOVA at a 0.05 level of significance. The results reveal that there was no significant variation in the academic performance of students' pretest mean scores taught with experiential learning and conventional methods. There was a significant difference between students taught by experiential learning and conventional methods in their post-test mean score of academic performance. Gender influences the academic performance of biology students. The study indicated that experiential learning is more effective in improving students' academic performance than conventional teaching methods in teaching biology. Based on the findings of the study it was recommended that Biology teachers should adopt experiential learning for teaching biology to secondary school students.

Keywords: *Biology, Conventional Method, Experiential Learning, Performance*

Introduction

Science is the understanding of the composition and activities of the usual and corporeal world which stands on information that can be verified in the circumstances of modern life. A person

who is literate in science and technology is in a good position to utilize his/her potential in developing the economy of his/her community (Ogundeji 2022).Science is the means to novelty, worldwide contest, and human progression. Science-wise the world has continued to progress, whether it's discovering novel treatments for cancer and other illnesses and investigating new galaxies. Science permeates daily existence that surrounds one 's day-to-day activities.

Biology is the science of Living Things which involves the study of life and living organisms, including their structure, function, growth, evolution, distribution, and taxonomy. Biology is one of the fundamental sciences that medical students and other medical professionals need. It teaches different forms of organic life and their relations with the environment and other sciences. Biology is relevant to our lives. Through the knowledge of biology, we know how the body functions, and the organs that are in the body, and learn about life in our environment. It helps us to know our genetic makeup and prevent some genetic disorders and diseases, Biology can also tell us about plants of major importance and how they help our body systems to be healthy.

However, the performance of students in Biology in senior secondary school is not encouraging despite its importance to human health. Inadequate laboratories, inadequate teaching facilities, overcrowded classrooms, inadequate availability of textbooks, and other learning resources, and students' negative attitude towards the subject among others seem to be factors contributing to this poor performance (Ogunleye 2023). According to Adeleye and Omotayo (2020), the likely contributing factors to the low performance of students in biology include insufficient funding, a lack of well-equipped libraries, a shortage of laboratories and necessary resources, and the use of traditional methods of teaching. In the traditional method, a teacher's primary instrument for presenting instruction is a chalkboard. Traditional approaches are entirely instructor-centered, with the expectation that students will recite and/or remember predetermined material that is provided in the form of lecture notes that are typed or written. Due to advancements in instructional aid and learning objectives, teaching techniques have significantly changed to accommodate the needs of individual students to be more interactive and engaging. To meet the learning process's goal, numerous strategies have therefore evolved through the adoption student-centred approach instead of an instructor-centred approach.

Based on the idea of learning by doing, experiential learning is a student-centered approach that utilizes students' prior knowledge and experiences to help them acquire life skills and cultivate a positive outlook on the world. Using critical analysis and application of experience, experiential

learning is an active learning tactic that helps students learn. The students themselves are the centre of the experiential learning process, and learning effectiveness is dependent on the student's ability to learn and think. It has been discovered that the experiential learning approach helps the learner to have a proper understanding of the subject matter (Ogundeji 2022 cited Groves et.al., 2010). It offers possibilities for learning and guarantees that knowledge is retained in a more meaningful way through in-depth reflection and internalization. Additionally, it allows the learner to critically examine the implications of their experiences and reflect on their professional contributions and consequences (Ogundeji, 2022).

Also, the study on the influence of gender on students' performance is vast but came with controversial results with some indicating that gender affects how well students perform in favour of female students (Ogunleye 2023 cited Owoeye 2017), some in favour of male students (Tarfa and Dike 2022) while some revealed that gender has no effects on students' performance (Ogunleye et. al., 2024). Considering this, the study was embarked upon to determine how experiential learning affected biology students' performance using gender as a moderating variable.

Statement of the Problem

As seen by the results of the West African Examination Council's Senior School Certificate Examination, student performance in biology has been falling recently. Significantly among the elements that are causing the ongoing low performance level in biology is the teacher using traditional teaching methods. Thus, it becomes apparent that the lecture method which is currently the major teaching approach in Nigerian secondary schools seems inadequate and ineffective for achieving the objectives of the biology education programme. It is imperative to employ pedagogical approaches that not only facilitate students' comprehension of biological ideals but also provide them the chance to actively participate in the teaching and learning process. Hence it is based on these that formed the problem that promoted this investigation to determine the impact of experiential learning strategy on the performance of students in biology in Ogun State.

Purpose of the Study

The study's objective is to assess how experiential learning affects biology students' academic performance. In particular, the study aimed to:

1. Ascertain the variation in the average student performance score between experiential learning and traditional teaching approaches.
2. Examine how gender affects biology students' performance

Hypotheses

The investigation was guided by the following null hypotheses which were tested at 0.5 level of significance.

H_{01}: There is no significant difference between students taught using experiential learning and conventional methods in the pre-test mean score of academic performance in biology.

H_{02}: There is no significant difference between students taught by experiential learning and conventional methods in their post-test mean score of academic performance.

H_{03}: There is no significant gender influence on the academic performance of student post-test mean scores taught with experiential learning and conventional methods.

Method

The study employed a Quasi-experimental research design in which an experiential learning strategy was used as an experimental group and a lecture method as a control group. The participants of the study were 89 students from two intact classes purposively selected from Biology students in Odeda, Ogun State. The schools were selected based on the following criteria: Accessibility to the researcher for proper monitoring must be private and of international standard, must be in odeda Local government, must be a mixed school and the school authority must be willing to allow the school to be used for the study. A biology performance test was used as an instrument for the study. The instrument was constructed by the researcher and is a multiple-choice question that had option A-D to choose from. The instrument consisted of thirty test questions which carried two marks each and its validities were carried out to remove ambiguity. Reliability was established using KR-20 with a value of 0.8 obtained.

The experiment lasted for 8 weeks, and it involved three stages: stage 1 involved visitation to the schools, permission from the administrative, heads of the participating schools, training of research assistants, and administration of pre-test questions to the participant. In stage 2 the experimental group was exposed to an experiential learning instructional guide while the control was exposed to a conventional teaching method instructional guide. In stage 3 at the end of the teaching period post-test was administered to the participant. Data were analyzed using ANOVA and hypotheses were tested at a 0.05 level of significance.

Results

H_{01}**:** There is no significant difference between students taught using experiential learning and conventional methods in the pre-test mean score of academic performance in biology.

Table 1: ANOVA of pre-test mean score of students in experiential learning and conventional method

Sources of variation	**SS**	**df**	**MS**	**F**	**P-value**	**F-critical**
Between Groups	577.6	1	271.3	6.20	0.12	46.13
Within Groups	476.4	88	5.24			
Total	1204.9	89				

Table 1 indicated ANOVA of difference in the pre-test mean score of academic performance of students exposed to experiential learning and conventional methods. It was revealed that (0.12> 0.05), and f-value (6.20) is less than F-critical (46.13). The null hypothesis is not rejected since there were no changes between the two groups' pre-test mean score performance before the intervention. This shows the groups' uniformity before the application of the treatment.

H_{02}: There is no significant difference between students taught by experiential learning and conventional methods in their post-test mean score of academic performance.

Table 2**:**ANOVA of post-test mean score of students in experiential learning and conventional method.

Sources of variation	**SS**	**df**	**MS**	**F**	**P-value**	**F-critical**
Between Groups	570.35	1	280.2087.70		0.0030	4.10
Within Groups	277.96	88	4.30			
Total	878.3289					

Table 2 revealed an analysis of variance of mean difference in the post-test mean score of students' academic performance taught with experiential learning strategy and conventional method. It showed that (0.0030< 0.05), and the f-value (87.70) is higher than the F-crit (4.10). The hypothesis is rejected which indicates there was a significant difference between students taught by

experiential learning and conventional methods in their post-test mean score of academic performance. Hence, to determine the magnitude of the group performance mean score, table 3 is shown as follows

Table 3: Estimated Marginal Mean of the experiential learning and conventional method

Treatment Groups	N	Mean	Std Error
Experiential learning strategy44	36.00	.110	
Conventional Teaching Method	45	22.20.120	

From table 3 above Experiential learning had a higher post-test mean score (36.00) than the conventional teaching method (22.20). This indicated that the experiential learning strategy performed better than the conventional method.

H_{03}:There is no significant gender influence on the academic performance of student post-test mean scores taught with experiential learning and conventional methods.

Table 4**:** ANOVA of gender influence on students' performance in experimental learning and conventional method

Sources of variation	**SS**	**df**	**MS**	**F**	**P-value**	**F-critical**
Between Groups	602.575	120.513	8.09	.00312.32		
Within Groups	265.748	43.16				
Total	868.328	9				

Table 4 shows the summary of the analysis of variance on the significant gender influence on the academic performance of students exposed to experiential learning and conventional methods. From the table it was revealed (0.0031 < 0.05) and f- value (38.09) is greater than F-crit (2.32). Hence, there is a significant gender influence on the academic performance of students' post-test mean scores with experiential learning and conventional methods. Therefore, the hypothesis is rejected.

Discussion

The finding indicated there was no significant difference between students taught by experiential learning and conventional methods. Therefore, the groups were identical before the treatment was

applied. It also further demonstrated that there was a substantial difference in the post-test average score of academic performance of students exposed to experiential learning and conventional methods. The experiential learning group was found to perform better than the conventional method this could be because of the use of real-life experiences in teaching. Through engagement, cooperation, and teamwork, it enables students to take an active role in their learning process. To help students acquire new abilities, attitudes, or ways of thinking, it first immerses them in an experience and then promotes reflection on the experience. The hallmark of an experiential classroom is students' active engagement in the learning process, which makes it interactive and fosters cooperation or teamwork (Ogundeji 2022 cited Bada and Akinbobola, 2017). it is also known as Transformative learning which is the "process of making a new or revised interpretation of the meaning of an experience, which guides subsequent understanding, appreciation, and action", it motivates students to collaborate with others and develop their sense of self-worth to express their original ideas(Konak, Clark & Nasereddin, 2014). This in turn enhances the learning experience of the learner and self-confidence levels which influences a positive attitude (Ogunleye, 2023) which in turn improves performance. The finding agrees with the finding of Ogundeji (2022) who reported that experiential learning improved student performance in biology. The unfortunate performance shown by students exposed to the conventional method in post-test mean scores may not be separated from the reality that the teacher's role in conventional strategy is too much. Students were given minimal roles to play which made them receive knowledge passively. There are typically few opportunities for learners to participate actively in their learning. The process was carried out by the teacher alone while the students just listened. Hence, prominence in the mode of instruction in this century should be students must play a major role in their learning. It must be active participation and engagement in the process instead of just having students absorb facts passively. This is what is traditional method of teaching does not have. Regrettably, this is what is commonly used in most of our schools today because it is very easy to use and saves time. Thus, more student participation in the teaching-learning process is necessary to ensure high-quality academic success (Ogunleye et. al. 2024).

Conclusion

Experiential learning strategy is more effective in improving student performance than the conventional method in biology because it improved comprehension of the students through

learning activities from experience which improve the assimilation and create a positive environment for effective interaction which improves academic performance.

Recommendations

Based on the results the following suggestions were made:

1. Biology educators should employ experiential learning for teaching biology to secondary school students,
2. Workshops and seminars should be organized for in-service teachers in the use of various activities-based strategies for teaching.

References

Adeleye, A.M. & Omotayo, K.A. (2020). Effects of Spaced and Blended Learning on Senior Secondary School Student's Interest in Biology in Ekiti State. *Euro Afro Studies International Journal 1(5) 11-22* https://www.easij.com/all-issues/

Etim, J. S., Etim, A. S., Heilman, G., Mathiyalakan, S. & Ntukidem, E. (2016). Gender influence on students' achievement in English language. *European Journal of Science and Mathematics Education,* 4(2), 186 - 195.

Konak, A., Clark, T. K., & Nasereddin, M. (2014). Using Kolb's experiential learning cycle to improve student learning in virtual computer laboratories .*Journal of Computers & Education*, 72, 11-22

Ogundeji, A. F. (2022). *Effect of Flipped Classroom and Experiential Learning Strategies on Students' Performance and Cognitive Style of Senior Secondary School Biology in Ogun State.* An Unpublished undergraduate Project Science Education Department University of Ibadan.

Ogunleye, A. T. (2023). *Effect of Computer simulation and STA on Students' Academic Performance and Attitude Towards Biology of Senior Secondary School in Oyo State.* An unpublished P.hD Thesis Science Education Department Ekiti State University, Ado-Ekiti

Ogunleye, A.T., Onifade, O.J., Ogundeji, A. F., & Sonde, P. O.(2024). Effect of Flipped Classroom Strategy on the performance and Cognitive Style of senior secondary school biology students in Ogun State, Nigeria. *Ilorin Journal of Education* 44(1), 318-329

Salah, R. O. (2016). Effectiveness of using computerized educational packages in teaching math curriculum on the learning of student in eighth grade at Ma'an City. *Journal of Education and Practice*, 7(12), 60 - 66.

Tarfa F. S. & Dike C. O.(2022) . Gender Differences in the Academic Performance of Students in Senior Secondary School Mathematics in Adamawa State. *International Journal of Innovative science and Research Technology 7(3) 424-430*