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Effect of Experiential Learning Strategy on Secondary School Students' Achievement in Basic Science

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Abstract
The main purpose of the study was to assess the efficacy of experiential learning strategy on secondary school students learning and achievement in basic science. It adopted a quasi-experimental non-randomized control pre-test and post-test design. All secondary schools in the study area were the target population, and two secondary schools were chosen at random to represent the two groups as the sample. A total of one hundred (100) students, two classes of fifty (50) each were created for the experimental and control groups. A pre-test was administered to the two groups before the experimental group received the treatment (Experiential Learning Strategy). A posttest was also administered to the experimental group after they had utilized the technique for six weeks. The only validated instrument employed in the study for data gathering was the Basic Science Achievement Test (BSAT). The instrument's reliability was assessed, and r =.70 was found. The findings showed that the experimental group's mean posttest achievement score (13.02) was higher than the control group's (9.54), and that male students scored (13.18) higher than the female students (12.97). The findings also showed that there was a significant difference in achievement scores between the experimental and control groups F1, 97=5.193, P<.05), but not between male and female students (F1, 47 =.398, P >.05). A few recommendations were made in light of the findings.
Keywords: Experiential Learning, Strategy, academic achievement, Science Education, Basic Science, Secondary School.

Introduction
Science education is crucial in today's atmosphere of highly inventive technologies. Consequently, Okoye (2011) said that efforts should be focused toward the standard production of teachers who are going to carry out the execution of the basic education curriculum in the science, so as to attain these goals. He further emphasized the relevance of teachers in any meaningful education. As a result, the performance of science teachers and handlers of students in the classroom is crucial and requires careful scrutiny. Many factors, including but not limited to the teaching style, techniques used, professional training, and attitude toward teaching and the subject matter, affected how effective the lesson can be learned. These elements are important for sustaining students' interest in the subject matter and their success in it (Joseph, 2019). Science education is the process of imparting to students certain necessary information, skills, and a scientific perspective.

Science education has impact on the environment, economy and the society, the construction of highly developed transportation infrastructure, and the development of highly qualified human resources. In Nigeria, science teaching focuses on eradicating students' misunderstandings and imparting knowledge of scientific principles and procedures (Aina, 2013). Given its importance to a nation's ability to develop its scientific workforce and economy, science education must be given top priority by any responsive government in all educational programmes. Teaching of Science education in Nigeria has its route and dates back to the time of the country's pre- independence era. People may enjoy their environment and develop into important members of society owing to scientific knowledge. Children in Nigeria are introduced to science as early as primary school with the main goal of increasing their interest and enthusiasm in the subject. According to (Anegbe & Adeoye, 2006). In order to successfully contribute to a country's scientific and technological growth, children learn, and "do" science. Consequently, children should be introduced to the principles of science materials at the primary level under the current basic education system.

The country's educational policy changed to basic education at the elementary and secondary levels of education was what led to the change in nomenclature from integrated science to "Basic Science." Basic education was included into Nigeria's educational system through the Universal Basic Education (UBE) programme. A revamped programme known as UBE is part of the change. Its goal among others is to reinforce the country's National Policy on Education (NPE) in order to increase access and provide high-quality education for all citizens which is both free and mandatory (Adomeh et al., 2007). Consequent upon the change, the Nigerian Education Research and Development Council (NERDC) sprang into action to revised the curriculum to synchronize the new policy document. It created methodologies and strategies to restructure and realign school curricula for the 9-year basic education system (Okoye (2011). The newly established policy is intended to provide the people the tools they need to be self-reliant, therefore basic science and technology are essential components in implementing the new curriculum. In the curriculum, students are instructed on ideas and concepts that will help them achieve the goals of their basic education. However, at the most fundamental levels, Basic Science is given to students as a stand-alone subject.

The overall objectives of the Basic Science and Technology curriculum, according to NERDC (2007), are to enable learners to:

1. develop a scientific curiosity;
2. acquire core scientific knowledge and knacks;
3. use scientific knowledge and skills to solve societal needs;
4. Take advantage of the numerous job opportunities available in science;
5. Prepare for higher studies.

Among other things, the aforementioned objectives are designed to get students ready for science classes in senior secondary school and at higher levels of education. This might be one of the motivations for the spiraling evolution of scientific learning from the most fundamental to the most sophisticated forms that the Basic Science and Technology curriculum promotes. Its goal was to keep students interested in studying science and technology. (2011) Hamza and Mohammed However, it has been noted that the aforementioned goals have not been realized in the subject in a real-world sense. This is demonstrated by pupils' historically low academic performance in basic science in secondary schools and by the way their interest has been weaned in the subjects (Joseph & Ikechukwu, 2013). All parties involved in the education sector are quite concerned about this scenario, thus they are looking into the main reasons for the students' low performance in the subject. There are varying viewpoints about the outcomes. A significant portion of people blame the teachers handling the subject, while others blame the subject's difficulty, poor and insufficient teaching and learning facilities, and inadequate laboratories. Any meaningful growth must therefore start with the development of human resources because the development of any nation or people depends greatly on the calibre of education they possess (Wobodo, 2010) in an effort to comprehend the causes of this noticed pattern. Danjuma (2009) looked into the elements that affected students' subpar performance and decreased enthusiasm in science in an effort to pinpoint the factor(s) responsible for the failure. The issue has not yet been resolved, despite suggestions for fixes. Although it was emphasized, the sort of approach teachers use in the teaching and learning process has not been thoroughly examined, which is the pointer to the identified shortcoming as indicated by the avalanche of literature (Che et al., 2021).

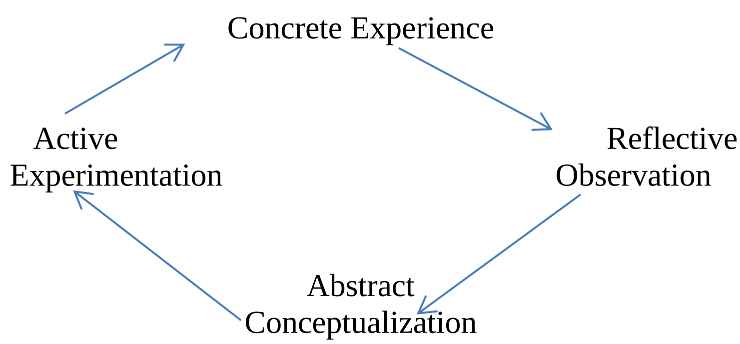
In light of the aforementioned, Joseph (2019) asserted that students must get hands-on experience in order to achieve the goals of fundamental science, which are essential for independence. This situation may have arisen from the fact that basic science is frequently taught without involving students in classroom activities; however, educational organizations are focusing on learning approaches that foster students' involvement, interest, and dynamic participation as a counterbalance to the traditional teacher-centric teaching approach and in response to the desire to increase interest in a more novel, participatory learning environment. To put it another way, there is a need for the application of experiential learning, which has emerged as an effective teaching strategy that not only encourages active learning but also provides real-life scenarios in which students interact and critically analyze course material, as you become involved in a topic being taught (Boggu & Sundarsingh, 2019). This strategy is based on research-based studies that allow students to apply what they learn in the classroom to real-world circumstances. It also increases active learning and as will boost students' achievement (Bradberry & De- Maio, 2019).

Svinicki and McKeachie (2014), explained that through experiential learning, students become more in charge of their learning, regulating a greater relationship between learning engagement, practices, and realities, all of which are crucial for learning motivation. It is vital to allow students time to develop their capacity to apply their knowledge and abilities in real-world situations to solve problems related to their professions, in addition to ensuring that they obtain the necessary information (Huang & Jiang, 2020). As a result, despite receiving solely theoretical and academic teaching, students appear to want additional hands-on training and skill development (Green et al., 2017). Furthermore, because motivation and engagement are important components of learning but are often disregarded in classrooms, they should be prioritized in educational institutions in today's society, where informed and high-performing persons are needed (Afzali & Izadpanah, 2021).

According to Salas et al. (2009), through experiential learning, students can apply what they learn in class to real-world challenges. They argue that taking education beyond campus gives students new perspectives and hands-on experience, allowing them to interact intimately with the community and achieve things they never believed possible. Through this hands-on approach to learning, students gain self-assurance in their abilities, find creative solutions to problems, and turn class assignments into practical experiences. The use of informal education, direct instruction, inquiry-based learning, comparison learning, and information processing techniques are just a few of the teaching strategies used in today's schools. Direct instruction is a more structured type of education that makes use of experiential learning. Some instructors almost only employ this strategy. It allows teachers to swiftly cover a lot of content with little to no hands-on learning for the students. Problem-based learning, experiential learning, hands-on learning, and critical thinking are other terms for inquiry-based learning. This approach is gaining popularity as a result of its high degree of flexibility and capacity to be customized for students of different levels. Teachers must monitor groups of students to ensure everyone remains on track since they have varied degrees of experience. To help students recall crucial information, some teachers also use information processing techniques.

The theoretical framework for the study hinged on the Kolb's model of experiential learning theory. Experiential learning was initially introduced by John Dewey and further developed by Kurt Lewin, Jean Piaget, and made well-known by David Kolb and Roy Fry. The principle holds that experience gained while learning produces knowledge. The theoretical paradigm of experiential learning, which maintains that learning is a natural human capacity and that experience is an essential element of both knowledge production and acquisition, is built on the humanistic and constructivist ideas. To put it another way, learning occurs when a person gains information via transformational events (Kolb, 1984). Kurt Lewin, Jean Piaget, and John Dewey's work served as the foundation for a theory formulated by David Kolb in 1984. Kolb (1984), after studying the preceding cycles and stages of Dewey, Lewin, and Piaget, developed a cycle to describe how people learn from experience. The cycle begins when the learner participates in a practical experience (CE). The learner then evaluates the experience and provides context (Reflective Observation, RO). The learner keeps on by coming up with explanations for the event and/or extrapolating from others (Abstract Conceptualization, AC). These findings then serve as the learner's guidance as they make judgments and plan out pertinent actions that may be taken to provide fresh, concrete experiences (Active Experimentation, AE). According to Kolb, experiential learning is also characterized by three characteristics. Learning is best understood as a process in which concepts are taken from and modified by experience rather than as a product of results-focused thinking. Learning is also ongoing. Finally, the process of learning necessitates the employment of conflict resolution techniques in daily life.

According to Kolb's model of experiential learning, effective learning occurs in four stages:



The cycle of experiential learning model of Kolb (1984)

Concrete experience: The learner either has a brand-new experience or reframes an already-existing experience.

Reflective observation: The student evaluates and considers the new experience, noting any discrepancies between experience and understanding of the materials.

Abstract conceptualization: By studying the concepts and drawing inferences and generalizations, the learner develops new ideas or concepts or modifies an existing abstract notion through the reflective process.

Active experiments: The learner makes plans, puts what they've learned to use, and can use what they've learned in various contexts. Conclusions and generalizations are used to test hypotheses, and as a result, the learner has new experiences.

The process of experiential learning comprises the student beginning at any of these four phases and progressing through them to learn new knowledge. To learn effectively, the student must complete all four steps of the paradigm; no step may be employed as a stand-alone learning strategy. Kolb created the experiential learning paradigm in 1984 to bridge the information transmission and application gap. It places a strong emphasis on experiential learning and grades learners based on prior knowledge (Sternberg & Zhang, 2014). The paradigm investigates the impact of experience on education and emphasizes the importance of learners' participation in all learning processes (Zhai et al., 2017). Experiential learning is a teaching technique that encourages students to "Do, Reflect, Think, and Apply" while they learn (Butler et al., 2019,). Students perform an experiential task (Do), duplicate it with more evidence (Reflect), develop ideas (Think) based on their experiences and knowledge, and then explain or solve a problem (Apply). Because it lets students to apply what they have learned in class to real-world challenges, it is a powerful tool for bringing about beneficial changes in academic education. Giving students more power and responsibility while actively integrating them in the classroom learning process is part of this technique. It also improves learners' adaptability. Full-cycle learning includes all conceivable modalities of learning and results in the development of practical skills and meta-learning competences (Kolb & Kolb, 2017).

When the model is strictly followed and successfully applied, the following benefits accrue to the learners: Students may expand on what they already know and have the chance to combine new and old concepts, which makes learning more meaningful to them. It increases the effectiveness of learning by encouraging students to exercise critical thought, hone their problem-solving skills, and make judgments. Students get the opportunity to take part in the activity and apply what they have learned. Experiential learning and team-based learning have been shown to improve retention in students. Memory is the ability to recall or recognize what has been taught or experienced, whereas retention is the capacity to recall or recognize what has been learnt or experienced. They pay attention to how theoretical concepts are applied in practice, examine that application, and generalize the findings from it. Due to the encouragement of group projects and the provision of support for other students, this raises student engagement. By strengthening the links between emotions and intellectual processes, it also aids with memory retention. Knowledge may be efficiently acquired by pupils when it is tied to values and emotions. Additionally, it can encourage students to develop the required abilities for lifelong learning by encouraging kids to think critically, picture issues, and make plans for the future. As a result, Guo et. al. (2016) asserted that students who actively participate in the learning process are not only able to understand more complex knowledge but are also able to extrapolate apply what they have learned to other problem solving in the society.

As was previously said, Dewy and his supporters originally developed the concept; however, it has since undergone situationalization and modification, causing those who applied to perceive it as operationalization to the circumstance in their own unique ways. In light of the aforementioned, numerous experts have seen and described the model in a number of ways, which we would want to examine in this study. Experiential learning, according to Zhu et al. (2017), is a style of teaching that enables students to learn while they Do, Reflect, Think, and Apply, suggesting that students work on real-world projects to learn. According to Parick (2011), experiential learning entails learning by doing. According to his interpretation, it implies a practical rather than a didactic approach to learning. According to Nell (2006), experiential learning entails learning by action, doing, experience, discovery, and investigation throughout a person's daily life. Experiential learning is any learning that enables students to apply their knowledge and conceptual understanding to real-world issues or circumstances.

Wurdinger and Cadson (2010) in Woke, (2014) put it that the teachers support this application by guiding and facilitating the learning. According to Auston and Rust (2015) (1997) defined experiential learning as a style of learning in which students participate in an activity. Before implementing their new information in their daily life, they should think about the experience and utilise their analytical skills to draw some insightful conclusions from it. The experiential teaching approach encourages students to engage in self-exploration in the classroom, which helps them gain awareness of their surroundings, understanding of their circumstances, and problem-solving abilities. Deim (2001), who was cited by Okujagu (2014), viewed experiential learning as a learn- by- doing approach that permits students to independently determine the truth and importance of a topic while being directed by the teacher. Experiential learning is thought of as action learning, when the learner builds knowledge by repairing or changing something (Afida et al, 2012). The experiential teaching style is often known as the hands-on or problem-based (PBL) approach.

The importance of first-hand, personal experience in the development of knowledge is emphasized by experiential learning, in other words, experiential teaching strategies are very effective for skill development because they provide students the chance to utilize their knowledge and reflect on their experiences. Since teaching needs automating teaching abilities or the capacity to engage in practiced activities with little cognitive processing, experiential teaching strategies are most suited for working with teachers. Instead of memorizing information, an experience approach begins with problems to solve (Wurdinger, 2010). While other forms of academic learning are focused on structure and reproductive learning, the bulk of experiential teaching features include analysis, initiative, and immersion (Ewing & Whittington, 2007). The goal of experiential learning is to provide the student with an experience from which they may learn. Studies have shown that students who are more physically involved in their studies and in the classroom as a whole learn more (Heyness, 2007). The critical thinking skills of students are enhanced via experiential learning. Critical thinking, which is the mental activity of actively and deftly conceiving, applying, analysing, synthesising, and evaluating information to reach a conclusion, is essential in addition to having stronger memory (Heyness, 2007) Finding the best teaching strategy for kids may improve their success rate.

Experiential learning affords students a good opportunity for hand- on and mind-on experience, and because it gives them access to real-world examples, students are more likely to be interested in the learning process (Matias et al., 2017). The study by Sholihah (2016) also shows how experiential learning can engage learners and present them with obstacles, which in turn motivates them to learn more and has a favourable effect on the learning process. Learners who are taught science in their schools utilizing experiential learning-based materials often have stronger cognitive capacities than students who are not. This was due to the fact that students draw on their experiences to learn effectively, particularly while tackling issues (Fitri, 2017). The benefits of experiential learning have practical ramifications for educators who are considering adopting this approach in their classrooms. In fact, they can ensure their students' success by equipping them with the knowledge needed to complete the task because, according to the experiential theory, knowledge is developed by turning practice into understanding. Teachers should also encourage students by offering information, suggestions, and relevant learning experiences for learning (Anwar & Qadir, 2017) and demonstrating their enthusiasm for participating in the learning path to create an environment in which students can engage in constructive yet demanding learning activities that support their interaction with learning materials. By actively engaging students in experiential activities, the teacher can improve their capacity for information retention, which encourages their innate drive and interest in the course subject (Zelechoski et al, 2017).

The current study is significant to students in this 21st century since it enables them to put the theory into practice by modelling appropriate behaviour and processes in practical settings and acquiring the learning skills that are needed in this 21st century. In fact, this approach enables students to go beyond memorization to assess and apply their knowledge, focusing on how learning might be applied to real-world circumstances most effectively (Zelechoski et al., 2017). The basic traits of experiential learning are participation, engagement, and application. When properly used, the significance is that education is provided across all domains, including cognitive, affective, and psychomotor domains to educate the full individual. Learners are also urged to exercise logical thought, come up with solutions, and act appropriately in situations that matter. This type of education offers opportunities for conversation and concept clarification, as well as for feedback, review, and the application of information and skills to new contexts. In light of the foregoing, we are inspired to look further into the improvement of the students' achievement in basic science by examining the efficacy of the teaching methods as a viable teaching method with a view to raising the standards given the significance of science and technology to the overall development of nations and the appalling performance of students in basic science.

Objectives of the Study

1. To examine the effect of experiential teaching strategy on Junior Secondary School students' achievement in Basic Science.
2. To determine gender difference in the effect of experiential teaching strategy on achievement in Basic Science among male and female Junior Secondary School students.

Research Questions

3. Is there any mean difference between the basic science achievement scores of students taught with experiential teaching strategy and those taught with the traditional method?
4. Is there any mean difference between the basic science achievement scores of male and female students taught with experiential teaching strategy?

Hypotheses

1. There is no significant difference in the mean achievement scores of students taught with experiential teaching strategy and the traditional method.
2. There is no significant difference in the mean achievement scores of male and female students taught with experiential teaching strategy.

Methodology

The study adopted a non- randomized control pre-test and posttest group quasi-experiential design. The design was chosen because it was aimed at establishing the effeteness of method strategies on students' achievement in Basic Science. Also, class of experiential group, and control group activities were not disrupted during the experiential treatment as intact classes were used. The participants were chosen from the study's population, which included all students in upper basic classes at public secondary schools throughout the state. From there, two schools were chosen at random, and the students chosen were made up of eleven men (11) and thirty-nine (39) female students, for a total of fifty (50) individuals recruited at random from the two schools chosen. Using simple random sampling techniques, the two classes were further divided into experimental and control groups.

The study made use of the permanent Basic Science Teachers at the chosen schools. First, an experimental learning technique was used to train the teacher in the experimental school on how to put the basic science instructions into practice. In the experimental school, the teacher gave the participants preparation tasks. Individual projects pertaining to the subjects to be covered were provided to the pupils in the experimental school. Students were generally required to learn by doing. The topics were subsequently taught to the students, including them in the learning process. During the lesson, the students were instructed to practice Kolb's experiential learning cycle among themselves, with the teacher, and with the instructional materials they had produced themselves. The students in the control schools were taught without involving them in any of the preparation of the instructional materials. After six weeks of continuous involvement of the students in the learning process, the Basic Science Achievement Test (BSAT) was administered as a post-test at the end of treatment.

The researcher created one instrument for data gathering purposes. It contains the following tests: Basic Science Achievement Test (BSAT). The BSAT is divided into two components (A and B). Section A requested information on the students' demographics, including gender, school name, location, and class. Section B sought information on students' Basic Science achievement. The segment had 31 questions selected from two sections in the Basic Science curriculum. The exam was made up of multiple-choice questions. The students had to select the correct answer from the options (a-d) displayed next to each question.

The content validity of the Basic Science Achievement Test (BSAT) was ensured using a table of specification covering the 31 items. The 31 items covered the two Basic Science topics taught to the students in the intact classes. The Cronbach's alpha statistical tool was used in determining the reliability coefficient which was found to be 0.81. b) Basic Science Achievement Test (BSAT).

A sample of thirty (30) JS 11 students from a different school were given thirty (30) copies of the Instrument. Since the Basic Science Achievement Test is dichotomously scored, the reliability of the coefficient was calculated using Kuder- Richardson (K-R20) using the scores obtained by the students. It was discovered to be r= 0.7. Research questions were answered using mean and standard deviation while the null hypotheses (Ho) were tested at an alpha level of 0.05 using Analysis of Covariance (ANCOVA).

Results

Research Question 1

Is there a mean difference between the basic science achievement scores of students taught with experiential teaching strategy and those taught with the traditional method?

Table 1: Summary of Descriptive Statistics

		Pretest		Posttest		Gain	
Group	N	Mean	SD	Mean	SD	Mean	SD
Experiential Group	50	12.58	4.94	13.02	4.69	0.44	4.07
Control Group	50	9.52	3.41	9.54	3.49	0.02	2.71

Table 1 displays the descriptive data on the difference in basic science achievement scores between students taught with the experiential learning technique and those taught using the control. The experimental group's pretest mean score was 12.58, SD=4.94, whereas their posttest mean score was 13.02, SD=4,69, and their mean learning gains was 0.44, SD=4.07. Students in the control group had a pretest mean score of 9.52, SD=3.41, a posttest mean score of 9.54, SD=3.49, and a mean learning increase of 0.02, SD=2.71. The outcome implied that the experimental group was more effective than the control group, which used the usual lecture technique to teach basic science in secondary schools.

Research question 2

Is there a mean difference between the basic science achievement scores of male and female students taught with experiential teaching strategy?

Table 2 Mean difference between basic science achievement scores of male and female students taught with experiential teaching strategy

		Pretest		Posttest		Gain	
Group	N	Mean	SD	Mean	SD	Mean	SD
Male	11	13.27	4.94	13.18	5.29	0.09	2.26
Female	39	12.38	4.99	12.97	4.59	0.59	4.46

The descriptive statistics on the difference between the basic science achievement scores of students taught utilizing the experiential teaching technique and those with a control are shown in table 3. The results showed that students taught utilizing the experiential teaching technique had a pretest mean score of 13.27, SD = 4.94, a posttest means score of 13.18, SD = 5.29, and a mean learning increase of 0.09, SD = 2.26. Students in the control group had a pretest mean score of 12.38, SD = 4.99, a posttest mean score of 12.97, SD = 4.59, and mean learning gains of 0.59, SD = 4.46. The outcome implied that the experimental learning technique was more effective than the control, the traditional lecture method, in the teaching of basic science in secondary schools.

Hypothesis 1

There is no significant difference in the mean achievement scores of students taught with experiential teaching strategy and the traditional method.

Table 3: Analysis of Covariance (ANCOVA) showing difference in the mean achievement scores of students taught with experiential teaching strategy and the traditional method

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1032.894[a]	2	516.447	52.996	.000
Intercept	221.096	1	221.096	22.688	.000
Pretest	730.134	1	730.134	74.924	.000
Treatment	50.602	1	50.602	5.193	.025
Error	945.366	97	9.745		
Total	119434.000	100			
Corrected Total	1978.160	99			

a. R Squared = .522 (Adjusted R Squared = .512)

The results of an ANCOVA in basic science academic achievement scores comparing students taught using the experiential learning technique and those taught using the traditional teaching method are shown in Table 2. The findings revealed a significant difference in mean basic science achievement scores between students taught using the experiential learning strategy and those taught using the traditional method (F1, 97=5.193, P<.05). The t null hypothesis one, there is no significant difference in the mean achievement scores of students taught with team teaching strategy and the traditional method was rejected.

Hypothesis 2

There is no significant difference in the mean achievement scores of male and female students taught with experiential teaching strategy

Table 4: Analysis of Covariance (ANCOVA) showing difference in the mean achievement scores of male and female students taught with experiential teaching strategy

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	448.682[a]	2	224.341	16.729	.000
Intercept	162.194	1	162.194	12.094	.001
Pretest	448.313	1	448.313	33.430	.000
Gender	.971	1	.971	.072	.789
Error	630.298	47	13.411		
Total	9555.000	50			
Corrected Total	1078.980	9			

R Squared = .416(Adjusted R Squared = .391)

The outcome from table 4 displays the ANCOVA of the fundamental science accomplishment scores for male and female students taught utilizing an experiential teaching style. The outcome showed no significant difference in the mean accomplishment scores of students according to their gender (F1, 47=.072, P >.05), at a 0.05 level of significance, supporting the null hypothesis 2. There is no significant difference in the mean achievement scores of male and female students taught with experiential learning strategy is retained.

Discussion of Findings

The findings of the study revealed that the experiential teaching strategy used provided better student outcomes than the traditional method they were used to. The results in table 1 further indicated that the mean achievement scores of students before the application of the experiential learning strategy were lower than the posttest achievement scores of the students. The observed difference in the achievement scores was a consequence of the new learning strategy the students were exposed to. The implication of the result was that the experiential teaching strategy was more effective than the control, that is, the traditional lecture method in the teaching of basic science in secondary schools. The findings partly agree with the assertion of the study by Sholihah (2016) also shows how experiential learning can engage learners and present them with obstacles, which in turn motivates them to learn more and has a favourable effect on the learning process.

Learners who are taught mathematics in their schools using experiential learning-based materials often have stronger cognitive capacities than students who are not, as evidenced by the fact that the mean scores of students taught using the experiential learning strategy were higher on the posttest than those taught using the conventional teaching strategy (lecture method). The premise that immersing students in the learning process leads in a more effective manner of learning and that teachers working together will increase student performance in general is at the heart of experiential teaching. According to Zhai et al., 2017), students who actively participate in the learning process not only understand more complex knowledge but can also use what they have learned in one context of problem solving. of problem solving to another. When experiential learning is properly applied, students' academic achievement improves. They continued by saying that it has always led to higher student achievement when teachers involve students in the learning process.

The outcome also showed that male students proved to be more inclined to the strategy than female students, especially as shown in the achievement scores. The findings indicate that the experimental learning technique worked better with male students than with female students. The Analysis of Covariance (ANCOVA) revealed a significant difference between the experimental and control groups, but no significant difference in achievement ratings between male and female, as shown in tables 2 and 4. According to the findings, students taught using the experiential method had higher mean scores as a result of the new method's effect on understanding of the content of the topics due to their involvement in the learning process, and the method was more appreciated by male teachers than female teachers.

Conclusion

The result of the study is clear on the significance of experiential learning strategies in the teaching and learning process in basic science. Consequently, it is concluded that students' academic achievement can be improved as well as their interest sustained when the experiential learning strategy is adopted by basic science teachers in secondary schools because students taught using the experiential teaching method outperformed their counterparts who were taught using different teaching methods on the same topics.

Recommendations

1. Since the experiential learning technique has been proven to be effective, fundamental science instructors and teachers in schools should make an effort to adopt it as the new model of instruction.
2. To guarantee that the teachers can use the new plan, the governing body(SUBEC) should schedule regular seminars for the basic science teachers in the state.

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