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Effects of Outdoor Activities and Advance Organizer Teaching Strategies on Students' Attitude towards Basic Science in Secondary School in Ekiti State

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Abstract
The study investigated the effects of Outdoor Activities and Advance Organizer teaching strategies on students' attitude towards Basic Science in Secondary school in Ekiti State, Nigeria. The study adopted non-equivalent pre-test post-test design. The population consisted of 12, 033 Basic Science students in Ekiti State while the sample consisted of 138 J.S.1 students (intact class size) drawn from three public secondary schools in the three Senatorial Districts of Ekiti State. The sample was selected using multistage sampling procedure. The research instrument 'Basic Science Attitude Scale (BSAS)' *was used to collect relevant data for this study. The face and content validity of the instrument was ensured while the reliability of the instrument was determined using split-half which yielded reliability co-efficient of 0.72. The data were analyzed using inferential statistics of Analysis of Variance (ANOVA) and Post-hoc analysis (Scheffe) with mean difference was carried out in order to investigate the source of the differences observed after treatment, all at 0.05 level of significance. The findings of the study showed that the three groups (Outdoor Activities, Advance Organizer and Conventional) were homogenous at the commencement of the experiment. The use of Outdoor Activities and Advance Organizer teaching enhanced students' positive attitude towards Basic Science. Based on the findings of the study, it was recommended among others that the use of Outdoor Activities and Advance Organizer teaching strategies should be encouraged in Basic Science class in Junior Secondary Schools so as to enhance academic performance of students in Basic Science. It was also recommended that Basic Science teachers should update their knowledge so as to accommodate the use of Outdoor Activities and Advance Organizer teaching strategies.*
Keywords: Outdoor activities, Advance Organizer, Teaching Strategies and Students' attitude.

Introduction

The term "teaching approach" refers to the general pedagogy and management style used for classroom instruction. A teacher's choice of teaching approach should not only be based on what fits/suits him or her but also putting into consideration the subject area, schools mission statement, class demography, etc. The choice of teaching approach according to Wikipedia may also depend largely on the information that the teacher or instructor intends to pass across to the students in his/her class, the skill that is to be taught, and it may be influenced by the attitude and level of enthusiasm of the students. Science lessons that are not interesting will not be able to motivate pupils to learn and subsequently will affect their scientific thinking skills and curiosity (Elvis, 2013)

The primary purpose of teaching at any level of education is to bring a fundamental change in the learner. To facilitate the process of knowledge transmission, teachers should apply appropriate teaching methods that best suit specific objectives and level exit outcomes. In the traditional epoch, many teaching practitioner widely applied teacher-centered method to impart knowledge to learners comparative to student-centered methods. Until today, questions about the

effectiveness of teaching methods on students learning have consistently raised considerable interest in the thematic field of educational research. Moreover, research on teaching and learning constantly endeavor to examine the extent to which different teaching methods enhance growth in student learning (Elvis, 2013). Safdar (2010) stated that "how to learn is equally important with what to learn but how to teach (teaching strategy) is more important than what to teach". Teachers make a difference. Some teachers reliably elicit greater gains than others because of differences in how they teach (Tennyson & Volk, 2015).

Teaching methods involve different activities of the teacher and the learners such as questioning, explanation, demonstration or direction. The activities can be referred to as skills or techniques. Thus, teaching methods involve different techniques and methods among which are lectures, cooperative learning, inquiry-oriented learning or inquiry-based methods with mobile devices for learning, self-directed study, computer-assisted testing/assessment (Sung, Chang & Liu, 2015). The use of these techniques vary with different teaching methods and also on many factors such as type of learning objectives, nature of the subject, age of students, number of students in a class among others (Aniaku, 2012). Quite remarkably, regular poor academic performance by the majority students is fundamentally linked to application of ineffective teaching methods by teachers to impact knowledge to learners (Elvis, 2013). Substantial research on the effectiveness of teaching methods indicates that the quality of teaching is often reflected by the achievements of the learners.

According to Ayeni (2011), teaching is a process that involves bringing about desirable changes in learner so as to achieve specific outcomes. In order for the method used for teaching to be effective, Elvis (2013) maintained that teachers need to be conversant with numerous teaching strategies that take recognition of the magnitude of the complexity of the concepts to be covered. Evidence from a number of disciplines suggests that oral presentation to a large group of passive students contributes very little to real learning (Christogonus, Okechukwu, Omebe & Martha, 2014). Teaching methods must be changed to reflect a modern society mandating the need of functioning, thinking-oriented, decision-making students. Therefore the selection of an appropriate teaching method is important to the success of the teaching and learning process. To be successful, teachers should select and use a wide variety of teaching strategies.

The methods used in teaching vary from one country to another, depending on the information or skills that is being taught and also being influenced by the aptitude and enthusiasm of the student. Various studies had been conducted concerning teaching methods, for example. Asikhia (2010) found that qualification of teachers and students' environmental factors do not influence students' poor performance but teachers' method of teaching influences poor academic performance. Furthermore, the method of teaching is dictated by the medium of instruction. It is also argued that classroom teachers urgently need to know more about effective teaching strategies (Oludipe & Oludipe, 2010). The commonly used teaching methods especially in developing countries are teacher centered, Guloba, Wokodola, & Bategeka (2010), which were viewed to be somewhat ineffective in the impartation of knowledge.

Problem-life learning as a teaching method is fast becoming increasingly popular in education institutions as a tool to address the inadequacies of traditional method of teaching since its approaches do not encourage student to participate in the learning process. However, more recently there is an argument in education industry to adopt a learner-centered paradigm shift while other schools of thought are advocating participatory methods of teaching (Saijad, 2011). There are various methods of teaching Basic Science but there is no single method of teaching that is absolute in meeting the learning needs of every individual learner in the classroom With the use of a variety of teaching and learning methods in classroom, it is anticipated that pupils' interest in science will be enhanced when the teaching is students' centered. Enekwechi, (2016) asserted that teaching approaches in which learners are actively involved would likely lead to meaningful learning and not rote learning.

Teaching and learning process is a mandatory part of education. Efforts are being made to enhance the quality of teaching and learning science. Similarly, efforts are being made to improve the learning of students in Basic Science through the application of variety of teaching and learning strategies (UzZaman et al, 2015).

Knowledge in Basic Science is central and indispensable to the development of every nation. This is due to its crucial roles in child's survival, adjustment and adaptation to his/her immediate and wider environments dominated by scientific activities. Basic Science is a basic subject that lays foundation for the take-off of pure sciences (biology, chemistry and physics) in secondary school classes.

Basic Science is the type of science which provides unique training of students in observation, reasoning and experiment in the different branches of science; it also helps students to develop a logical mind. Basic Science enables students to be systematic and enables them to form an objective judgment. Basic Science, if taught according to its philosophy, equips students with the necessary introductory scientific and technological knowledge and skills necessary to build a progressive society. This forms the bedrock on which scientific and technological studies rest (Ochu & Haruna, 2014).

In Nigeria, in spite of the enormous role that Basic Science plays in providing a solid foundation for the mastering of basic concepts in science and technology for national development, and the efforts of government and other stakeholders in improving science education, results in Basic Science in most certified examination bodies like the results of examination conducted by National Examinations Council (NECO) and Ekiti State Ministry of Education, Science and Technology have not been satisfactory. The broad aim and expectations of any teaching and learning programme is productivity and positive-evaluated end-product (achievement).

Researchers have given some reasons why students always perform below average in Basic Science which include methods of teaching adopted by the teachers in teaching Basic Science which is mostly conventional method, which is not recommended for teaching Basic Science (Lakpini, 2012). This is because lecture method entails one way flow of communication from the teacher to the students and it is teacher-centered approach whereby most of the decisions are carried out by the teacher while the students remain passive listeners.

In this process, the students are denied the opportunity to develop the required manipulative skills needed in learning science (Owoeye, 2017). The use of conventional method is attributed to the fact that the school calendar in Nigeria is often interrupted by industrial actions and public holidays, and there is a need for completion and covering of the syllabus to prepare students for both external and internal examinations. Hence the use of conventional method which is less time consuming and can be used to teach large and small class size (Ashaolu, 2011).

Basic Science outdoor teaching is the act of taking students outside the classroom to learn some Basic Science concepts and themes as they occur in natural settings. The students usually have first-hand experience in natural and technological settings. The experiences gained during outdoor lessons are perceived to be long lasting and vivid. This may discourage rote learning.

According to Sakariyawu, Taiwo & Ajagbe (2016), the attitude of a learner towards a subject will determine its attractiveness or repulsiveness and this will invariably influence the learner's performance in that subject. He concluded that the attitude of students' towards science subject is related to the performance in science.

Attitude according to Sakariyawu et al, (2016) refers to predisposition to classify objects and events, to react to them with evaluative consistency. A person who shows a certain attitude towards something is reacting to his conception of that thing rather than to its actual state. Attitude are formed by people as a result of some kinds of learning experiences if the experience is favourable, a positive attitude is found and vice versa (Orunaboka, 2011). The attitude people hold can frequently influence the way they act in person and larger situation. For this reason,

administrators, psychologists and sociologists are concerned with attitude development, how they affect behaviuor and how they can be changed (Sakariyawu et al, 2016). Attitude does not only include the negative attitude such as prejudices, biases and dislikes, but also positive attitudes are sometimes called sentiment, which include our attachment and loyalties to person, objects and ideas (Sakariyawu et al, 2016).

Attitudes thus seem like a system of ideas with an emotional core or content. Human beings are not born with attitudes, they learn afterwards. Some attitudes are based on the people own experience, knowledge and skills and some are gained from other sources. However, the attitude does not stay the same. It changes in the couple of time and gradually (Olasheinde & Olatoye, 2014). Similarly Joseph and Emmanuel (2017) postulated that attitudes are generally positive or negative views about a person, place or event which are often referred to as the attitude object. He further quoted Allport's definition of attitude as "a mental and neural state of readiness organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related".

Common to the various definitions is that attitude is a psychological orientation developed as a result of one's experiences, which influences how a person views situations, objects or people, and how he or she appropriately responds to them. The response may be positive or negative; favourable or unfavourable; neutral or ambivalent. According to Wiener as quoted by Joseph & Emmanuel (2017), attitudes express our evaluation of something or someone. They are based on our knowledge, feelings and behavior and they may influence future bahaviour.

Fasakin (2012) recognized attitude as a major factor in a subject choice. He also considered attitude as a mental and natural state of readiness, organized through experiences exerting a directive influence upon the individual's responses to all objects and situation with which it is related. Attitude can be defined as "feelings, beliefs and values held about the enterprise of school science, school and the impact of the science on society" Osborne as quoted by Esme, (2016). Ibitoye was quoted by Joseph and Emmanuel (2017) identified three broad areas where we might wish to explore attitudes in relation to students:

- Attitudes toward subjects being studied
- Attitudes towards study self
- Attitudes towards the implications arising from topics being studied

In general, attitude in life allows us to:

- Make sense of ourselves
- Make sense of the world around us
- Make sense of relationships in different dimensions.

Ekweme (2013) reported that students' attitude towards studies fall under the following four sub-headings:

a. Student's perception about the nature of knowledge;
b. Student's perception about the role of the teachers in their learning
c. Student's perception about their own role of learning
d. Student's perception about the nature and role of assessment.

In his study, Newhouse as quoted by Esme (2016) defined attitude as positive or negative feelings about a person, an object or an issue. In addition, Klopfer as quoted by Esme (2016) proposed six dimensions regarding 'attitudes towards science' namely; the manifestation of favourable attitudes to science and scientists; acceptance of scientific inquiry as a way of thought; adaptation of scientific attitudes; enjoyment of science learning experiences; development of interest in science and science related activities; and the development of interest in pursuing a career in science.

Newhouse as quoted by Esme (2016) emphasized that attitude is a very important factor in influencing human behavior. Attitude is affected by personal opinion, and these opinions can be

formed through personal life experiences and education. Attitudes towards science involves the students' affective behaviour; for example preference, acceptance, appreciation and commitment. Development of positive attitudes towards science, scientists, and learning science, which has always been a constituent of Science Education, is increasingly a subject of concern (Sakariyawu et al, 2016).

For about two to three decades in Nigeria, researches have reported that students' enrollment in the science dwindled year by year. The trend was described with such terms as "a swing away from science", "a movement away from science", and "a drift away from science" and "unimpressive enrolment in science among others (Sakariyawu et al, 2016). Salim was quoted by Sakariyawu et al, (2016) aptly described this trend as unhealthy for a technologically ambitious country like Nigeria. According to them, the attitude of a learner towards Science or Mathematics will determine his attractiveness or repulsiveness to Science or Mathematics. This, invariably, will influence the learner's achievement in that subject. He concluded that the attitude of students towards science subject is related to the performance in science.

Intelligence is not the only determinant of the academic performance of the student. Academic performance is always associated with many components of learning environment. It is worth noting that students' academic performance is affected by numerous factors including age, gender, students, school, parent/guardian socio economic status, residential area of students and school factors (Abdullahi, Mlozi & Nzalayaimisi, 2015).

Educational institutions are mandated to use education as a tool for social integration. The success of a school is measured by the quality of students it produces. The success of any educational institution is measured by the performance of its students in both academic and non-academic test. This is supported by Yusuf (2012) when contending that the performance should not only be based in terms of test and examination results and student ability to apply what is learnt and the rate at which students move on to higher institution of learning, but should include other areas such as whether the students have acquired the survival skills. In spite of that, the use of students' achievement in academic work to access the teacher's effectiveness has gained ground (Luke & Mavis, 2014).

The measure of academic performance as a symbol of school success can be traced way back from the Victorian period (Bell, 2013). Since then, academic performance has been used to grade schools and most importantly to determine ones career paths. The 'good schools' are acclaimed to be those that are able to groom the students well enough to achieve the set standards. This is measured by the use of students' academic performance both at school level and nationality. The importance of students' high performance has attracted the attention of the public, policy-makers, educators, learners and Ministry of Education (Luke & Mavis, 2014). Research has indicated that school leadership, teacher's quality, personal support and students are detrimental to students' high or low academic performance. Collaboration between school leaders, teachers, students and parents can assist in promoting students teaching (Luke & Mavis, 2014). Studies have equally shown that there is a relationship between teaching methods and students' academic performance. For example, it has been found that teachers who used a specific style of evidence-based teaching and operate within a developmental learning paradigm had an increase effect on student learning outcome (Owoeye, 2017), thus teaching methods play an important role in producing good students' performance. It is believed that when there is effective use of instructional strategies, there will be positive attitude from the students which will enhance learning outcome.

For the last thirty years, student's attitude towards science has become an increasingly popular subject of research for science educators. Factors such as science achievement, gender difference, student-student and student-teacher interaction and the classroom learning environment all have an effect on the attitude towards science (Ali, Yager, Hacieminoglu & Caliskan, 2013). The

results of these studies indicate that there is a relationship between attitudes towards science and science achievement (Esme, 2016).

Research findings by Sakariyawu et al (2016) showed that Nigerian students have negative attitude towards science. Again, Balogun was quoted by Sakariyawu et al (2016) reported that, in general, the attitudes of Nigerian students towards the Basic Sciences tend to decrease in the order, Biology, Chemistry and Physics.

Many researchers Ogunniyi, Akpan, Akale, STAN, Eze, Habour-Peters as quoted by Sakariyawu et al (2016) among others reported that the negative attitudes of Nigerian students towards science were responsible for their low enrolment in the science subjects in secondary schools. According to them, students demonstrated lack of interest in the study of science, they were generally truant, lukewarm and disenchanted with the whole enterprise. The implication is that students who possess these dispositions tend to reject science as a subject.

The learners' academic achievement is considered as a product of their attitude towards science. Wilson, Taylor, Kowalski and Carlson (2010) asserted that the learner's interest, achievement and motivation is due to positive attitude and is directly related to the constructive attitude to science and will also have a positive attitude towards science syllabus, science learning environment and science teachers. The learner's disposition towards science is more fruitful, beneficial and influential than just success in science subjects.

Oh and Yager as quoted by Esme (2016) stated that while students' negative attitude towards science are related to a traditional approach in science instruction, their positive feelings are associated with constructivist science classrooms. The authors also commented that if students are provided with too much scientific information, they will have a more negative attitude. Thus, the authors suggested that the learning environment should be designed in such a way as to allow students to attain scientific knowledge and gain a more positive attitude towards science.

Several studies have indicated that the classroom learning environment is a strong factor in determining and predicting students' attitudes toward science Lawrenz, Simpson & Oliver, Riah & Frase, Aldophe, Fraser & Aldridge as quoted by Esme, (2016) among others. In other words, the classroom environment generally shows a positive correlation with attitude. The meta-analysis of research of Weinburg as quoted by Ayodele (2016) showed that there was a moderate correlation between attitude towards science and achievement, although this correlation is stronger for high and low ability girls.

Similar findings were found in the study conducted by Osborne and Collins as quoted by Ayodele (2016) further corroborated the relationship between attitude of students' towards sciences and achievement, Martin et al as quoted by Ayodele, (2016) emphasized that there was a clear positive association between students' attitude towards sciences and science achievement. On average, students' with positive attitudes are likely to continue their efforts and willingly perform the learning assignments.

More so, in the study to determine the prediction of attitude and interest of science students of different ability on their academic performance in Basic Science. Adodo & Gbore (2012) quoted Johnson that the solution to changes in student's attitudes lies in the hands of teachers. That teachers should use interesting teaching methods in the teaching of science, as this innovation will not only bring about an improvement in students' performance in science but will also bring about lasting and permanent positive attitude towards science.

Study of the attitudes of students as a factor in the learning of Integrated Science affirms that learning of Integrated Science as a science subject has to do with the attitudes of the students in order to generate interest. It confirmed that there is a correlation between attitudes that the Integrated Science students bring to the Integrated Science class and their performance in the subject.

Teaching and learning need not to take place exclusively within classroom buildings. The outdoor environment has massive potential for learning. The outdoor environment offers

motivating, exciting, different, relevant and easily accessible activities from pre-school years to college. Outdoor learning experiences are often remembered for a lifetime. Integrating learning and outdoor experiences whether through play in the immediate grounds or adventures further provides relevance and depth to the curriculum in ways that are difficult to achieve indoors.

Teaching Basic Science through outdoor activities may reduce the perceived abstract nature to a vivid reality by exposing the students to the practicality of Basic Science. In the outdoor Basic Science activities, learning objects are real material objects in the surrounding. The students will be exposed to the original/actual materials instead of bringing the dummy to the classroom to demonstrate.

Outdoor teaching activities could allow better acquisition of knowledge by students, as the activity could be experienced with different senses as a result of their physical interaction with nature within their environs, this would make them to form their personal opinion about events. The Outdoor activity strategy of teaching science encourages group interactions among pupils and if properly used, the spirit of teamwork, exchange of ideas and respect for each other's point of view will be enhanced at early stages of learning. Another feature of Outdoor activity-based teaching strategy is that local resources can be effectively utilized in the teaching process. In typical students' activity, costly scientific equipment is often substituted with locally available teaching aids (Iwuji, 2012).

Science, as a subject, is fundamentally fascinating to students and involves them in an adventurous exploration individually or in groups. Such a learning process calls for students to learn science through an open-ended process approach to better understand scientific concepts and grasp essential skills. First-hand experiences should be one of the essentials in teaching (Farmery) as quoted by (Saroja, 2013). Ideas relating to the importance of children learning outside are not new and have a provenance that includes writers such as Rousseau, Montessori and Kolb among many others. Indeed, in 2013 the Ofsted Report into Science Education found that: 'invariably, achievement was highest where pupils were involved in planning, carrying out and evaluating investigations that, in some parts, they had suggested themselves (Ofsted, 2013). The results of Ting & Siew (2014) showed a significant difference in post-test mean score between students in outdoor group and control group in both students' science process skills and scientific curiosity.

Research has been carried out to evaluate the impact of outdoor learning in improving students' performance in understanding science. Commonly, it is reasoned that outdoor learning is the better platform of active and engaging learning that benefits students the most especially in understanding science rather than learning in the indoors (Fagerstam, 2012). Evidence taken by House of Common Select Committee findings strongly indicated that education outside the classroom is of significant benefit to pupils. Academic fieldwork clearly enhances the teaching of Science and Geography, but other subjects such as History, Art and Design and Citizenship can also be brought to life by high quality educational visits. Group activities, which may include adventurous expeditions, can develop social skills and give self-confidence.

Studies on Field work which is an academic or other investigative studies undertaken in a natural setting, rather than in laboratories, classrooms, or other structured environment show that students learn science content or concepts via observations, (structured or unstructured) discussion as well as through analysis of other forms of collected data. The collected data could be in the form of specimens, video and or audio recorded objects and phenomenon (Nurshamshida et al, 2013). Field study does not only allow students' active engagement with each other but also helps develop an understanding of the experience and process of learning in natural setting. Nurshamshida et al (2013), who used field study as an approach to teaching found his students accurately describing plants and animals they had observed in different habitats during field trip.

An Advance Organizer is a statement of inclusive concepts to introduce and sum up material that follows. Ausubel as quoted by Samuel, Anthony & Zachariah (2013) defined an Advance Organizer as a cognitive instructional strategy used to promote learning and retention of new

information. This teaching was first introduced and used by Ausubel in 1960. Every experienced teacher and developer of instructional materials knows that the way instructional material is introduced to a student influences student motivation and learning. Such introduction provides a perspective of what lies ahead and serves as a framework on which subsequent learning could be based. In addition, such introductions suggest to the learner that which is important or essential within the material. In designing instructional materials, thought and care should be given to choosing the best way of preparing students for, and introducing them to, new and different learning materials. These introductions have been termed Advance Organizer Ausubel as quoted by (Samuel et al, 2013).

An Advance Organizer is information that is presented prior to the learning that could be used by the learner to organize and interpret new incoming material, Mayer, as quoted by (UzZaman, Chouhury & Qamar, 2015). Mayer further explains Ausubel's theory in terms of his assimilation encoding theory. He emphasized that if the learner already had previous knowledge of the content to be learnt, the Advance Organizer would not be as effective as when the student is new to the content material. Hence Advance Organizer is effective for new learning. Results of several studies have revealed the efficacy of using Advance Organizer in teaching students. It is very easy for teachers to learn how to use Advance Organizer in their classrooms with minimal training, and is easy for students to show interest in using Advance Organizer.

The use of Advance Organizers has been argued by researchers to link previous knowledge with the new learning. Some researchers believed that the gap between prior knowledge and new learning can be closed and students are able to understand better and retain more when organizers are used. The use of Advance Organizers is not a teaching method on its own but a teaching strategy needed to help clarify the science concepts the students are trying to attain. Studies have revealed that Advance Organizers favours higher achievement and retention abilities and facilitate acquisition of more scientific concepts.

The studies of Umesh (2017) revealed that, the teaching of science by the Advance Organizer Model is better than by the conventional methods of teaching of science, Advance Organizer Model of teaching appealed to the students very much and they felt encouraged to learn the subject matter with interest which was presented to experimental group during the experiment. The results of the experimental design prove the superiority of Advance Organizer Model over the traditional method, the mean achievement score of the experimental groups were highly significant than the mean score of the controlled group at post - test which could have not come by chance. It is statistical proof of the superiority of the experimental method and not only the mean scores were higher on the whole achievement test but they were significantly higher on the test items based on the material presented through the Advance Organizer Model.

Studies carried out by Ajaja and Ojeifo as quoted by Atomatofa (2013) revealed that the use of advance organizer by students had facilitating effects on the students learning and retention of the concepts they were taught. However, other researcher in separate researches found out that the use of organizer did not have any facilitating effect on students achievement and retention of the concepts they were taught. Also, studies carried out by Lin and Chen revealed that advance organizer is of facilitative effects on students' achievement than the non–advance organizer group. Studies carried out by Enekwechi (2016) indicated that students taught chemistry with Advance Organizer achieve better and had a higher level of scientific attitude than their counterparts taught with the conventional method. The results of the study of UzZaman et al (2015) showed that the use of Advance Organizer Strategy had a positive effect on the performance of experimental group. The findings of the study of Taylor and Francis (2019) showed that Advance Organizer Model was more effective than the conventional method with effect size of 0.49. Also, the findings of Omondi, Keraro & Anditu (2018) showed that there was statistically significant difference in achievement between learners in favour of those taught using advance organizer compared to those taught using conventional teaching methods.

This study investigated the effects of Outdoor Activities and Advance Organizer teaching strategies on students' attitude towards Basic Science in Secondary school in Ekiti State, Nigeria.

Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:

1. There is no significant difference in the attitude of students exposed to outdoor activities, advance organizer and conventional strategies before treatment
2. There is no significant difference in the attitude of students exposed to outdoor activities, advance organizer and conventional strategies after treatment

Methodology

This study adopted non-equivalent pretest, post – test design using 3 x 2 x 2 factorial design with two experimental groups and one control group. The treatment that was applied to the experimental group 1 is the outdoor activities while advance organizer was applied to experimental group 2. The teacher in each group uses these strategies to teach students and determine the effect on students' attitude towards in Basic Science subject.

The population for this study consisted of all 12,033 co-educational public junior secondary one (JSI) Basic Science students across the sixteen local government areas of Ekiti State. As at the time of this study, Ekiti State had a total of 191 public secondary schools. *(**Source**: Ekiti State Ministry of Education, Science and Technology, Ado, 2018)*

The sample for the study consisted of 138 junior secondary one (JSI) Basic Science students who were selected from three co-education public secondary schools across the sixteen LGAs of Ekiti State using multistage sampling procedure. At the first stage, three LGAs were selected from the sixteen LGAs using simple random sampling technique. The second stage involved the selection of three towns out of the three LGAs earlier selected using simple random sampling technique. The third stage is the selection of three co-educational public secondary schools in each of the towns selected using simple random sampling technique. The last stage involved the selection of three intact JSI Basic Science class from each of the schools selected for the study.

The instrument titled: "Basic Science Attitude Scale (BSAS)" was used for this study. The research instrument was certified by professionals in Psychology, Test and Measurement and those in the field of Basic Science for face and content validities. The reliability of the validated BSAS instrument was ensured through split-half method. This was carried out on a selected secondary school which was not included in the main study. The instrument has two sections. Section A elicited information on the students' bio - data such as their gender, name of their school and age while section B consisted of 25 items which measured the students' attitude towards Basic Science learning. The BSAS was structured in 4 – points Likert – like scale: Strongly Agree (SA) – 4 points; Agree (A) – 3 points; Disagree (D) – 2 points and Strongly Disagree (SD) - 1 point. The instrument was administered on 26 JSI Basic Science students outside the experimental group. The reliability of the instrument was determined by split-half procedure with the reliability coefficient of 0.72.

The experimental procedure was in four stages namely: pre-treatment stage, treatment stage, post-treatment stage and retention stage. At pre-treatment stage, the schools were randomly selected and assigned to experimental and control groups respectively. The two research instruments were administered on Basic Science students in the selected school by the researchers, with the help of the Basic Science teachers in the school, who were trained to be the research assistants. The responses from the students were scored and analyzed using One –Way Analysis of Variance

(ANOVA) in order to ensure that the groups were homogenous. The pre-treatment stage lasted a period of one week.

At the treatment stage, students in the experimental group 1 were taught using outdoor instructional package; students in the experimental group 2 were taught using pictorial advance organizer package while students in the control group were taught using conventional method of teaching (i.e. within the classroom). The students in the experimental groups were guided in the use and practice of the methods. Three separate lesson notes (one for each group) were prepared in form of packages for each of the selected topics. The topics that were taught are types of human activities that affect environmental balance; ways in which a community/school can dispose refuse; concept of biodegradable and non-biodegradable materials; classification of materials found in refuse dump site into biodegradable and non-biodegradable materials and the need for environmental sanitation. The treatment stage covered a period of four weeks.

The post-treatment stage involved the re-arrangement and administration of BSAS items on the students. This is done in order to determine the effects of teaching strategies used in the study. The study from pre-treatment stage to post-treatment stage lasted for six weeks: the first week for pre-test, followed by four weeks for treatment and the last week for post-test.

The responses of the students to the research instrument were collated and analyzed using the appropriate inferential statistics using One-Way Analysis of Variance (ANOVA), and Post-hoc analysis (Scheffe) with mean difference was carried out in order to investigate the source of the differences observed after treatment, all at 0.05 level of significance.

Results and Discussion

Results

Hypothesis 1: There is no significant difference in the attitude of students exposed to outdoor activities, advance organizer and conventional strategies before treatment.

Table 1: Analysis of Variance (ANOVA) for difference in attitude of students in experimental and control groups before treatment.

Groups	Sum of Squares	df	Mean Square	F	P
Between Groups	29.940	2	14.970	1.85	.16
Within Groups	1091.886	135	8.088		
Total	1121.826	137			

P > 0.05

The result presented in Table 1 showed that F-cal value of 1.85 is not significant because the P value (0.16) > 0.05. Hence, the null hypothesis is not rejected. This implies that there is no significant difference in the attitude of students exposed to outdoor activities, advance organizer and conventional strategies before treatment.

Hypothesis 2: There is no significant difference in the attitude of students exposed to outdoor activities, advance organizer and conventional strategies after treatment.

Table 2: Analysis of Variance (ANOVA) for difference in attitude of students in experimental and control groups after treatment.

Groups	Sum of Squares	df	Mean Square	F	P
Between Groups	14161.616	2	7080.808	774.32*	.00
Within Groups	1234.507	135	9.144		
Total	15396.123	137			

* P < 0.05

The result presented in Table 2 showed that F-cal value of 774.32 is significant because the P value (0.00) < 0.05. Hence, the null hypothesis is rejected. This implies that there is significant difference in the attitude of students exposed to outdoor activities, advance organizer and conventional strategies after treatment. In order to investigate the source of the differences observed, Post – hoc analysis (Scheffe) with mean difference was carried out.

Table 3: Scheffe Post – hoc analysis and mean for observed difference in the attitude of students in the groups.

Groups	Mean	Outdoor Activities	Advance Organizer	Control Group
		81.28	62.61	57.78
Outdoor Activities	81.28			
Advance Organizer	62.61	*		
Control Group	57.78	*	*	

* P < 0.05

In Table 3, a significant difference was found between the attitude of students exposed to outdoor activities strategy and advance organizer strategy in favour of students exposed to outdoor activities strategy. Also there was significant difference between the attitude of students exposed to outdoor activities strategy and conventional group in favour of students exposed to outdoor activities strategy. Furthermore, there was significant difference between the attitude of students exposed to advance organizer strategy and conventional group in favour of students exposed to advance organizer strategy.

The result of post – hoc analysis also showed that, of all students exposed to outdoor activities, advance organizer and conventional strategy, the attitude of students exposed to outdoor activities was the highest. Their attitude in Basic Science was significantly better than those exposed to advance organizer and conventional strategy. Again, the attitude of students in Basic Science exposed to advance organizer strategy was better than those in conventional group, implying that the attitude of students in Basic Science exposed to conventional strategy was the least.

Discussion

The results of the analyses showed that there was significant difference in the attitude of students to Basic Science in the experimental and control groups in favour of the experimental groups. This is in line with the findings of Jegede and Awodun (2015) on effects of outdoor activities on students' attitude towards physics in secondary schools which revealed that there was significant difference in the attitude of students to Physics in the experimental and control groups in favour of the experimental groups. The findings showed that students attitude in the three groups towards Basic Science before administering treatment on the students' were not encouraging. This

aligned with the findings of Longe and Adedeji, Oh and Yage as quoted by Esme (2016), Adodo and Gbore (2012), Sakariyawu et al, (2016) and several others who were of the opinion that students' attitude towards science are related to the method of science instruction, acceptance of the myth that science is abstract in nature, not concrete, provision of too much scientific information. This was responsible for the low enrolment of students' in science subjects at secondary schools and the implication is that students who possess these dispositions tend to reject science as a subject.

Conclusion

Based on the findings of this study, it was concluded that, the three groups (outdoor activities, advance organizer and conventional) were homogeneous at the commencement of the experiment. The use of activities based teaching strategy (outdoor advance organizer) enhanced better students' attitude towards Basic Science.

Recommendations

Based on the findings of this study, the following recommendations were made.

- The use of outdoor activities strategy should be encouraged in Basic Science class in secondary schools so as to enhance better academic performance of students in Basic Science.
- The use of advance organizer strategy should be encouraged in Basic Science class in secondary schools so as to enhance better academic performance of students in Basic Science.
- During Basic Science classes, there should be no discrimination between male and female students
- Students should be encouraged to form better attitude towards Basic Science

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