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Effect of Activity-Based Teaching Strategy on Students' Academic Performance in Mathematics Concept

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Abstract

This study examined the effect of Activity-Based Teaching Strategy on Secondary School Students' Academic Performance in Mathematics in Ilorin, Nigeria. Quasi-experimental research of non-equivalent control group design was employed for the study. This design was adopted to compare the performance of students who were taught Binary Numbers with Activity-Based Teaching Strategy and those taught with conventional method. The findings of the study showed that: (i) experimental group in private school had the mean score of ($\bar{x}$ = 15.00) while the counterpart in the control group had the mean score of ($\bar{x}$ = 13.25); (ii) experimental group in public school had the mean score of ($\bar{x}$ = 12.00) while the counterpart in the control group had the mean score of ($\bar{x}$ = 9.73); (iii) private school students performed better than public school students with the mean different of ($\bar{x}$ = 3.00) after been taught mathematics concept with activity-based method; (iv) there was no significant difference in the performance of male and female students taught mathematics concept using activity-based method. (.561 > 0.05); and (v) there was a significant difference between the academic performance of students taught mathematics concept with activity-based method based on school ownership (.000 <0.05). The study concluded that complex ideas in mathematics can be understood easily with the help of activity-based teaching. It is recommended that Mathematics teachers should be trained to update their knowledge in the use of activity-based teaching strategy for making the teaching and learning of Mathematics more interactive and interesting.

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Keywords: *Binary Numbers, Control Group, Experimental Group, Instruction, Teaching Strategy*

Introduction

Teaching is an interactive process through which knowledge and skills are shared with students with a view of improving understanding and ability to bring about desirable learning. Thus, teacher initiates the communication and interactions through proper instructional process and methods. According to Ayeni (2017), teaching can be defined as a systematic process of transmitting knowledge, attitudes and skills in accordance with professional principles. Meanwhile, the main purpose of teaching at any level is to bring out a significant change in the learner. However, transferring knowledge requires teachers to use the appropriate method and pedagogy that best suits the learner and suit the objectives and desired outcomes. Thus, effective teaching methods is required to stimulate learners' interest in other to form a base for achieving desired curriculum objectives in a school setting (Maheshwari, 2017). The Federal Republic of Nigeria (FRN, 2013) in the National Policy on Education emphasized the adequate choice of teaching method and strategy by teachers to solve educational problem and

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enhance students learning. This is because it has been observed that the reason for student's poor performance is as a result of the teaching method applied by the teacher. Studies from Bello, Bukar & Ibi (2016) confirmed that the negative attitude of learners at the basic education level towards certain subject is a result of poor teaching technique. Also, Ogide (2017), states that teachers in secondary schools use mainly the conventional or traditional method which is a teacher centred method and the implication is that learners are passive and learning tends to be superficial.

Essentially, teacher-centered teaching methodologies are considered obsolete; a big burden with little impact on the learning development of the child; there is need for emphasis on those teaching methods that will fully and actively involve students rather than being passive, ignorant and mere recipient of knowledge. The choice of a particular method of teaching by the teacher determined by number of factors which includes the content to be taught, the objectives which the teacher plans to achieve availability of teaching and learning resources and the ability and willingness of the teacher to improvise if convectional teaching aids are not available, evaluation and follow-up activities and individual learner differences (Ndirangu, 2017). The methods used in teaching varies, depending on the information or skills that is being taught and also be influenced by the aptitude and enthusiasm of the student. Various studies had been conducted concerning teaching methods, for example Asikhia (2017), found that, qualification of teachers and students' environment factors do not influence students' poor performance but teachers' methods of teaching influence poor academic performance while Adunola (2016), also said that regular poor performance by majority students is fundamentally linked to application of effective teaching methods by teachers to impact knowledge to learners. Most of the traditional teaching methods are teacher-centered with no activity for the learners making them passive and therefore obtaining knowledge from the teacher without building their engagement level with the subject matter and the approach is least practical, more theoretical and memorizing (Tebabal & Kahssay, 2016). Student-centered approaches which are more effective are more encouraged because they embrace the concept of discovery learning (Brindley, 2015).

Conventional method is being majorly used by many Teachers. Whereas, the method is said to be ineffective or obsolete as it does not promote active learning and ability to foster critical thinking, holistic learning environment among learners and does not consider individual differences existing in each class as their abilities vary considerably and thereby not meeting the different needs of the students (Gadzama, 2018). It is believed that involving learner in the teaching and learning via activity-based methods will make teaching and learning more interesting, make the classroom environment lively, arouse the interest of the learners and sustained their interest and attention throughout the teaching and learning period (Shafiu, 2015). This is because activity-based learning is an instructional approach that emphasizes students' active learning through various activities to develop the three domains of learning (cognitive, affective, and psychomotor) equally (Priyono & Boedi, 2017). The realization of the importance of mathematics to man and the society probably account for its' inclusion in the school curriculum as a compulsory subjects so as to enable individual to face challenges of life and to enhance national development. Mathematics is a prerequisite subject for many fields of learning that contributes immensely to the technological growth of the nation (Ahmed, 2018). This includes medicines, pharmacy, nursing, agriculture, forestry, biotechnology, nanotechnology, and many other areas (Ahmed & Abimbola, 2015). Also, Umameh, (2021) was of the view that mathematics is bedrock and an indispensable tool for scientific, technological and economic advancement of any nation.

Mathematics is the foundation of science and technology and the functional role of mathematics to science and technology is multifaceted and multifarious. Mathematics as a subject is indispensable in the development of any nation with respect to science and technology since mathematics itself is the language of science. Mathematics as one of the core subjects in secondary school curriculum in Nigeria represents one of the modern curricular arrangements which focuses on enhancing students' reasoning and problem-solving skills (Pandey, 2017). Despite the fact that mathematics is one of the major and hinge of science subject in Nigeria schools, it is quite unfortunate that the subject is being dreaded by many students today and so many factors are responsible for students' poor academic performance in mathematics such as: negative attitudes of students towards mathematics, poor instructional strategies, abstract nature of the subject, difficulty paying attention, lack of practice and poor learning environment schools among others (Oni & Isola, 2019).

Mathematics is one of the most poorly taught, widely hated, and abysmally understood subjects in Nigerian secondary schools (Ali, et al., 2018). This is evident in the persistent poor performance of Nigerian secondary school students in external examinations such as the Senior School Certificate Examination (SSCE). Poor academic achievement in mathematics could be attributed to many factors among which are the teachers' teaching methods. This means that mathematics concepts cannot be well understood if students are not taught with an effective teaching method. In the teaching of mathematics, strategies that involve critical thinking and the generation of innovative minds need to be employed. A binary number is a number expressed in the base-2 numeral system or binary numeral system, a method of mathematical expression which uses only two symbols: typically, "0" (zero) and "1" (one). The base-2 numeral

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system is a positional notation with a radix of 2. Each digit is referred to as a bit, or binary digit. Because of its straightforward implementation in digital electronic circuitry using logic gates, the binary system is used by almost all modern computers and computer-based devices, as a preferred system of use, over various other human techniques of communication, because of the simplicity of the language and the noise immunity in physical implementation. Counting in binary is similar to counting in any other number system. Beginning with a single digit, counting proceeds through each symbol, in increasing order. Before examining binary counting, it is useful to briefly discuss the more familiar decimal counting system as a frame of reference.

The call for the Student-centered approach which according to (National Teachers Institute, 2020), appealed to the needs and interest of the learner, thereby motivating continuous learning. The focus is on learner, encourage participation and interaction throughout the lesson period, gender sensitive, collaborative as well as encourage critical thinking. The student-centered therefore is said to be the current thinking about teaching that is active, constructive in which the teacher assumes the role of a guide by emphasizing the learner, guiding the learner, and promoting learner development. Saga (2021) asserts that if the existing strategy of teaching is not yielding results, then, other teaching strategies should be adopted. Given this, there is a need for a paradigm shift to using methods that are appropriate, relevant, and effective to teaching mathematics.

However, gender plays a significant role on students' academic achievement, especially in science subjects. The importance of studying students' performance as linked to gender differences is particularly related to behavioral differences and perception between boys and girls (Adigun, 2021). Voyer and Voyer (2014) to equivocally state that differences between boys and girls proceed in a common design on tests scores, regardless; girls have the edge on test scores irrespective of the subject matter. The implication is that society should not regard boys as better achievers than girls in matters involving a lot of logical reasoning. Voyer and Voyer (2014) educators have observed a trend where girls perform better than boys in science that need logical thinking. In another study, Pillow (2008) while investigating the relationship between academic achievement and gender differences established that individual's environment to a larger extent affect student cognitive and non-cognitive behaviors in test scores. In classroom environment, teachers may promote gender bias when a learning platform is created that favors the success of either boys or girls. Male gender performs excellently well in structural assignments, while female gender excels in languages.

On the influence of school ownership (public and private) in teaching and learning process. If certain types of schools have more resources or a better learning environment, students who attend these types of schools are more likely to perform better. Conversely, those students who attend schools with fewer resources for practical and disruptive environments tend to perform poorly, which could ultimately limit their prospects in life (Amanda & Marrazzo, 2018). In addition, as learning environments and gender play important roles not only in students' academic performance but also in their socialization in a broader sense, school ownership that are highly stratified along socio-economic lines could inadvertently undermine social cohesion. Socio-economic stratification, as well as how students' educational experiences differ depending on whether they attend publicly or privately managed schools (OECD, 2016). Privately managed schools may have the authority to hire and compensate teachers and staff, and thus can select better-prepared teachers and introduce incentives for performance. Privately managed schools may also have more discretion on curricula and instructional methods, and so can adapt them to the interests and abilities of their students. The need to attract students means that privately managed schools must be more sensitive to parents' demands concerning curricula, teaching methods, facilities and discipline, and more responsive to students' needs (Epple, Figlio and Romano, 2015). It is on this premise that this study seeks to assess the effects of activity-based teaching strategy and conventional method on Secondary school students' academic performance in Mathematics.

Statement of the Problem

Mathematics is used either consciously or unconsciously in various aspects of life and is the basic tool for industrialization and national development. It is also recognized to play a vital role in contemporary society, making it indispensable for the existence of any nation (Asante, 2021). The importance of Mathematics can be seen in its applications to science and technology, medicine, the economy, the environment, and in public decision making. The implication is that for effective functioning in society, there is a need for all the citizens to study and understand science and mathematics.

Analysis of students' achievement in Mathematics shows that the performance of Nigeria students is not encouraging (Heick, 2020). According to the Naija News (2019), 43.30% of candidates that wrote the 2018 West African Examination Council (WAEC) in Nigeria obtained credits and above in Mathematics, this shows the abysmal performance in the state. WAEC Chief Examiner for the private candidates (2018) further observed that candidates were weak in the areas such as Mensuration, Translation of word problem to form equations, Sequence and Series, Inequality, Histogram, Circle Geometry, Matrices, and Construction. This has always led to poor academic achievement and has been a great thing of worry to all educational stakeholders, such as parents, teachers, educational psychologists, counselors, government, and society at large. This is because mathematics is today, part of the basic requirements for entrance into tertiary

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institutions. This consistent poor performance by students in mathematics calls for serious national action to remedy the situation. Poor academic achievement in mathematics could be attributed to many factors among which are the teachers' teaching methods (Mvula, 2021). This means that mathematics concepts cannot be well understood if students are not taught with an effective teaching method. The teaching of mathematics in Nigeria is mainly theoretical and talk and chalk method with fewer hands-on activities and fewer methods that directly engage the student to capacity build the ability to think and solve problems independently (Adigun, 2021).

With the advent of the concept of discovery learning, there is need to widely adopt suppler student-centered methods to enhance active learning. The student-centered approach in mathematics will help to promote interest, analytical research, critical thinking and enjoyment among students as it is more effective since it does not centralize the flow of knowledge from the teacher to the student. Therefore, for better performance of students, there is the need to adopt activity based student-centered approach instead of depending on the conventional approach. This study therefore seeks to find out whether activity-based and problem- solving method might have a positive impact over the conventional method on students' performance in Mathematics.

Methodology

Quasi-experimental design of non-randomized control group design was used to compare the performance of students who was exposed to the Activity-based strategy for learning mathematics concept and those exposed to conventional method. Students' performance test on a Mathematics concept was administered on both the control and experimental groups. The Experimental Group were subjected to a treatment using activity-based teaching technique while the Control Group were taught with the conventional teaching method. The research design layout is shown on table 1.

Table 1: Research Design Layout

Groups	Treatment	Test
Experimental Group	Activity-Based Test	O_1
Control Group	Conventional Classroom	O_2

$$\begin{matrix} X & O_1 \\ - & O_2 \end{matrix}$$

Where,

O_1 represents the Experimental Group,

O_2 represents the Control Group,

X represents the treatment for the Experimental Group,

- represent the conventional method for the Control Group.

The independent variable in this study was the Conventional and Activity-based teaching method. The moderating variables were gender and school ownership of students while the dependent variable was the academic performance of both the experimental and control group. The population of this study was all private and public secondary schools in Kwara state Nigeria. The target populations for this study were students from a selected private and public Junior secondary school in Ilorin South, Ilorin, Kwara State Nigeria. Specifically, Junior secondary students were purposively selected as samples for this study. The class was divided into two which consist of the experimental group and control group. Intact classes of 22 students constitute the experimental group in private schools while 20 students were also sampled for the control group. 27 students constitute the experimental group in public schools while 30 students were also sampled for the control group.

Research Instrument

Two research instruments was developed and used by the researchers to gather relevant data in this study. The instruments include: (i) Activity-based Teaching Strategy (ATS) and (ii) Student Performance Test in Mathematics (SPTM). Activity-based Teaching Strategy (ATS is an instructional approach that emphasizes students' active learning through various activities to develop the three domains of learning (cognitive, affective, and psychomotor). This experiential learning focused on learning by doing, students physically and mentally explore **binary numbers** as a mathematics concept doing various activities. Activity-based method is a method of teaching that enables students to be involved in reading, writing, discussion, practical activities, analysis, and evaluation of the topic under discussion. Student Performance Test in Mathematics (SPTP): A list of 20 questions objective test developed by the researcher and with its items selected from binary number system which are in the Junior Secondary School Mathematics curriculum and the lesson plan will be used as instructional tool for the study. The researchers collected a letter of introduction from the Department of Educational Technology which was taken to the target Secondary schools. The researcher visited the selected schools to get official permission to use the schools and students for the study. Data was collected with the help of research assistants.

The experimental group was taught a mathematics concept using the activity-based teaching method specifically a mathematics activity game based on the binary numbers system. The treatment lasted for one week after which the researcher also taught the experimental group. The control group was simultaneously given the SPTP with the help of the research assistants and they were taught with the conventional method for one week after which the post-test were also administered to them. The SPTM was administered to both groups. The experimental group were taught selected mathematics concepts with the conventional teaching method and later exposed to ABL for a period of one week while the control groups were simultaneously taught the same concepts with the conventional teaching method.

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Data Analysis Techniques

The analysis and interpretation of data obtained from the test items were carried out using descriptive and inferential statistics. Percentage, Mean and standard deviation were used to answer the five (5) research questions. Independent t-test was used to test hypotheses 1 and 2. All hypotheses were tested at 0.05 level of significance.

Results and Discussion

This chapter presents the analysis and results obtained from the data gathered based on research questions and hypotheses formulated in this study. The data presented provide a summary of the major characteristics of the respondents that were involved in the study. The respondents comprised of different gender of male and female in this study, 49(49.5%) were male while 50(50.5%) were female. The respondents were also distributed based on school type. 42(42.4%) of the respondents were from private schools while 57(57.6%) of the respondents were from public school. Furthermore, the respondents in the experimental group 49(49.5%) while those in the control group were 50(50.5%) respectively. Demographic data collected were analysed using frequency counts and percentage while they were further presented using graphs charts. The two hypotheses generated were tested at 0.05 level of significance. The results from the analysis of data are presented as follows:

Data Analysis

Demographic Information of the Respondents

Table1:Distribution of the Paticipants Based on Gender

Gender	Frequency	Percentage
Male	49	49.5
Female	50	50.5
Total	**99**	**100.0**

Table 1 shows the total number of pupils that participated in this study to be 99. Out of these 99 Students, 49(49.5%) were male while 50(50.5%) were female. The result from table 1 shows that male pupils participated more than females pupils in the study. Figure 1 further presnts the distribution in pie chart

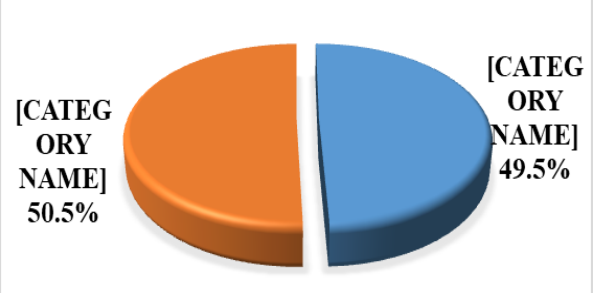

Figure 1: Distribution of the Participants Based on Gender

Table 2: Distribution of the Paticipants Based on School Ownership

School Type	Frequency	Percentage	Cumulative
Private	42	42.4	42.4
Public	57	57.6	100.0
Total	**99**	**100.0**	

Table 2, shows the participants' distribution based on school ownership. The table shows that 42(42.4%) of the participants are from private school while 57(57.6%) of the respondents are from public school. Based on the distribution, it shows that public school students participated more than private school students in the study. Figure 2 further presents the distribution in pie chart

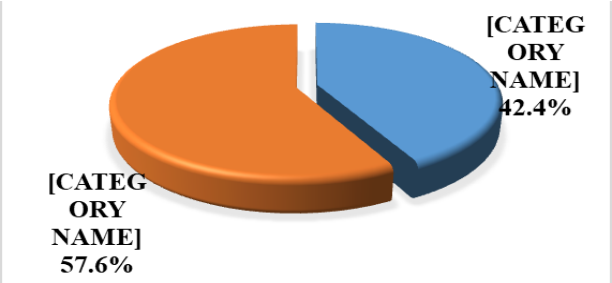

Figure 2: Distribution of the Paticipants Based on School Ownership

Table 3: Distribution of Participants Based on Treatment Groups

Group	Frequency	Percentage
Activity-based Learning Strategy (ALS)	49	49.5
Conventional Method (CM)	50	50.5
Total	**99**	**100.0**

Table 3, shows the number and percentage of the participants in each of the two groups (Activity-based Learning Strategy and Conventional Method groups) that were used for this study. The table 3 shows that 49(49.5%) of the participants were in ALS group while 50(50.5%) were in conventional method group. Figure 3 further presnts the distribution in pie chart

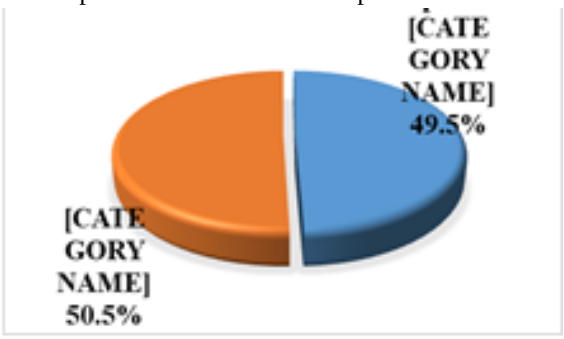

Figure 3: Distribution of Paticipants Based on Treatment Groups

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Results

Research Question One: what is the academic performance of junior secondary school students taught mathematics concept using activity-based method and those taught with conventional method in private school.

Table 4: Percentage, Mean and Standard Deviation Showing the Academic Performance of Junior Secondary School Students Taught Using Activity-based Method and those Taught with Conventional Method in Private School

Group	N	Percentage(%)	Mean	Std. D
Activity-Based Strategy (Experimental Group)	22	55.46	15.00	2.91
Conventional Method (Control Group)	20	44.54	13.25	2.51

Table 4, shows the percentage, mean and standard deviation of the students in both experimental and control group in private school. Experimental group with the mean score of ($\bar{x}$ = 15.00) while control group with the mean score of ($\bar{x}$ = 13.25). Based on the mean score of each group, it can be inferred that experimental group in private school performed better than their counterparts in the control group. The different between the academic performance of students in both groups is ($\bar{x}$ = 1.75). That is, the mean score of students taught with activity-based strategy is higher than that of those taught with conventional method. Using percentage to establish the performance of both groups, students taught with activity-based strategy had 55.46% while those taught with conventional method had 44.54.

Research Question Two: what is the academic performance of junior secondary school students taught mathematics concept using activity-based method and those taught with conventional method in public school.

Table 5: Percentage, Mean and Standard Deviation Showing the Academic Performance of Junior Secondary School Students Taught Using Activity-based Method and those Taught with Conventional Method in Public School

Group	N	Percentage (%)	Mean	Std. Deviation
Activity-Based Strategy (Experimental Group)	27	52.60	12.00	2.51
Conventional Method (Control Group)	30	47.40	9.73	2.49

Table 5, shows the percentage, mean and standard deviation of the students in both experimental and control group in public school. Experimental group with the mean score of ($\bar{x}$ = 12.00) while control group with the mean score of ($\bar{x}$ = 9.73). Based on the mean score of each group, it can be inferred that experimental group in public school performed better than their counterparts in the control group. The different between the academic performance of students in both groups is ($\bar{x}$ = 2.27). That is, the mean score of students taught with activity-based strategy is higher than that of those taught with conventional method. Using percentage to establish the performance of both groups, students taught with activity-based strategy had 52.60% while those taught with conventional method had 47.40.

Research Question Three: what is the difference between the academic performance of junior secondary school students taught mathematics concept with activity-based method in both private and public school

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Table 6: Percentage, Mean and Standard Deviation Showing the Difference between the Academic Performance of Junior Secondary School Students Taught with Activity-based Method in Both Private and Public School

Group	N	Percentage(%)	Mean	Std. Deviation
Activity-Based Strategy (Experimental in Private)	22	50.46	15.00	2.91
Activity-Based Strategy (Experimental in Public)	27	49.54	12.00	2.51

Table 6, shows the difference between academic performance of junior secondary school students taught mathematics concept with activity-based method in both private and public school. Experimental group in private school with the mean score of ($\bar{x}$ = 15.00) while experimental group in public school with the mean score of ($\bar{x}$ = 12.00). Using percentage score to establish the difference in the performance of both students, students taught with activity-based strategy in private school had 50.46% while those taught with activity-based strategy in public school had 49.54. Based on the difference in the score of the students, it can be inferred that private school students performed better than public school students. The different between the academic performance of students in both schools is ($\bar{x}$ = 3.00). That is, the mean score of private school students is higher than that of those students in public school even though they were both exposed to active-based teaching strategy.

Hypotheses Testing:

Hypothesis One: There is no significant difference between the academic performance of junior

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secondary school students taught mathematics concept using activity-based method based on gender.

Table 7:t-test Showing Significant Difference Between the Academic Performance of Junior Secondary School Students Taught Mathematics Concept Using Activity-based Method Based on Gender

Gender	N	X	SD	Df	T	Sig.(2-tailed)	Decision
Male	24	13.08	2.96				
				47	-.58	.561	Not Rejected
Female	25	13.60	3.20				
Total	**49**						

Table 7 shows that df (47), t= -.586, p= .561 This means that the null hypothesis was not rejected. This was as a result of the t-value of -.586 resulting in .561 significance value which is greater than 0.05 alpha value. Thus, the stated null hypothesis was established: There was no significant difference between the academic performances of junior secondary school students taught mathematics concept using activity-based method based on gender. Also, the values of the mean scores do not reveal any appreciable difference.

Hypothesis Two: there is no significate difference between the academic performance of students taught mathematics concept with activity-based method based on school ownership

Table 8:t-test Showing Significant Difference Between the Academic Performance of Students Taught Mathematics Concept with Activity-based method Based on School Ownership

School	N	X	SD	Df	T	Sig.(2-tailed)	Decision
Private	22	15.00	2.91				
				47	3.87	.000	Rejected
Public	27	12.0	2.51				
Total	**49**						

Table 8 shows that df(47), t= 3.87, p= .000 This means that the null hypothesis was rejected. This was as a result of the t-value of 3.87 resulting in .000 significance value which is less than 0.05 alpha value. Thus, the stated null hypothesis was rejected: There was significate difference between the academic performance of students taught mathematics concept with activity-based method based on school ownership. The mean score of private school students is higher than that of public school students. That is, private school students performed better than public school students after been taught concept of mathematics using activity-based method.

Discussions

Research Question on the academic performance of junior secondary school students taught mathematics concept using activity-based method and those taught binary number systems with conventional method in private school revealed that students taught with activity-based strategy performed better than their counterparts taught with the conventional method with a percentage difference of 10.92%. This result is in agreement with Wiggins (2017) who reported that interaction between the teacher and students during the teaching and learning process of mathematics encourages the students to search for knowledge rather than the teacher monopolizing the transmission of information to learners. This shows that there was a significant relationship between activity-based method and students' academic performance in mathematics.

Research question two examined the academic performance of junior secondary school students taught mathematics concept using activity-based method and those taught with conventional method in public school. Results reveal that students taught with activity-based strategy performed better than their counterparts taught with the conventional method with a percentage difference of 5.20%. This result agrees with Daluba (2018) who averred that for better performance of students, the use of activity stimulating and student-centered approach will be necessary instead of depending on the conventional approach.

Research question answered the difference between the academic performance of junior secondary school students taught binary number system with activity-based method in both private and public school. Based on the difference in the score of the students, it can be inferred that private school students performed better than public school students. The different between the academic performance of students in both schools is ($\bar{x}$ = 3.00). That is, the mean score of private school students is higher than that of those students in public school even though they were both exposed to active-based teaching strategy. The finding of this study is in agreement with the finding of Mokiwa and Agbenyeku (2019), who found a significant difference in the academic performance between the experimental groups exposed to the activity-based teaching strategy when compared to the control group exposed to the traditional lecture method in both public and private schools.

Hypothesis one tested the significant difference between the academic performance of junior secondary school students taught mathematics concept using activity-based method based on gender. Findings show that there was no significant difference between the academic performance of junior secondary school students taught mathematics concept using activity-based method based on gender. Also, the values of the mean scores do not reveal any appreciable difference. This finding agrees with the findings of Stanley (2017) that understanding and retention are products of meaningful learning when teaching is effective and meaningful to the students whether male or female. Thus, meaningful learning is the product of students' involvement in an act of learning such as seen in Activity-Based Instructional Strategy.

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Also, this finding agrees with that of Ajayi (2017) and Manu (2018) who observed that the type of instructional strategy used does not discriminate between male and female.

Finally, hypothesis two tested the significant difference between the academic performance of students taught mathematics concept with activity-based method based on school type. As revealed, there was no significate difference between the academic performance of students taught mathematics concept with activity-based method based on school type. The mean score of private school students is higher than that of public school students. That is, private school students performed better than public school students after been taught concept of mathematics using activity-based method. As supported by the conclusion of Mokiwa and Agbenyeku (2019), who opined that that the reason for this may be that activities in Mathematics classes in private schools provide opportunities to work with tangible materials and increase the motivation and interest of the students. Additionally, it may be considered that the presentation and content of the activities made it easier to learn the subject and relate it to daily life.

Ethical Approval Declaration

"All procedures involving human participants in this study were conducted in accordance with the ethical standards set by applicable research guidelines and the principles of the 1964 Declaration of Helsinki and its subsequent amendments. Ethical approval was secured before the commencement of data collection."

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This study did not receive any external funding.

Data availability:-

The datasets generated and analysed during the current study will be available from the author upon reasonable request.

Consent for publication:-

I hereby provide consent for the publication of the manuscript detailed above.

Competing interests:-

The authors declare no competing interests

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