



EFFECT OF EXPLICIT TEACHING STRATEGY AND COLLABORATIVE LEARNING APPROACH ON STUDENTS' MOTIVATION, ACHIEVEMENT AND RETENTION IN MATHEMATICS IN BENUE STATE, NIGERIA

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ABSTRACT: *This study examined the effect of collaborative learning and explicit teaching strategy on students' motivation, achievement and retention in mathematics in Benue State, Nigeria. The study adopted Quasi-experimental design. The population of the study was 36,286 SS1 students in 749 secondary schools in Benue State. A sample of 180 students were selected from the three educational zones in Benue State using the simple random sampling technique. Mathematics Achievement Test (MAT) and Mathematics Motivation Inventory (MMI) were employed for data collection and it was analyzed using Mean, Standard Deviation and Analysis of Covariance (ANCOVA). The results showed that there was a significant difference in the mean achievement score of students taught mathematics with collaborative learning approach and explicit teaching strategy. Furthermore, there was a significant difference in the mean retention score of students taught mathematics with collaborative learning approach and explicit teaching strategy. Finally, there was a significant difference in the motivation score of students taught mathematics with the collaborative learning approach and explicit teaching strategy. The study concluded that the collaborative learning approach improved students' motivation, achievement and retention in mathematics more than the explicit teaching strategy. The study recommended that the Ministry of Education should fast-track the process of incorporating the collaborative learning approach in subjects like mathematics for effective teaching and learning of the subject.*

KEYWORDS: Explicit Teaching Strategy, Collaborative Learning Approach, Achievement, Motivation, Retention, and Mathematics.



INTRODUCTION

The wrong perception of students about mathematics has continued to grow over the years. Today, even pupils at the primary school level view mathematics as a difficult subject. As Obodo (2004) noted, the children view mathematics as a subject capable of making even adults “mad” and, as such, they do not learn mathematics with the required seriousness. This scenario among other factors has led to students’ low achievement in mathematics and the ugly trend has been on the increase (Chief Examiners Report, 2020). Achievement, according to Akani (2015), is to quantify the success recorded by students in an academic task to determine the stand of a student at a given moment after teaching and evaluation. Kabutu, Oloyede and Bandele (2015) corroborated that it is beneficial to find out the retention of information and skills in order to ascertain the effectiveness of educational teaching and learning process. Thus, retention is the capacity of the students to sustain the knowledge acquired immediately or long after it has been acquired.

Consequently, the level of students’ motivation is essential in influencing the retention capacity of the students assimilating educational instruction. This is because motivation is the condition that activates and sustains behaviour towards a goal. Unfortunately, keeping students motivated towards mathematics learning is one of the crucial issues institutions are facing, despite motivation being imperative concerning student achievement and future vocations (Saadati & Celis, 2023). This implies that the anticipated goals of learning mathematics, especially statistics, can be attained after students are motivated in the study of the subject. Adzer (2019) described statistics as a scientific method for gathering, organizing, summarizing, presenting and analyzing data with intentions of making effective decisions or inferences in line with the analysis. Emaikwu (2012) posited that statistics is a branch of mathematics that is concerned with collection, classification, analysis and interpretation of numerical data. The study of statistics thus helps us to engage in precise measurement of resources with a view of deriving maximum satisfaction. It also serves as a bedrock in preparing students who will engage in proper research work.

Regrettably, a study conducted by Amua (2019) indicated students’ poor achievement in mathematics, especially statistics. The poor performance of students in statistics questions reflected clearly in the West African Examination Council (WAEC) between 2001 to 2015. The Chief Examiner’s report (2016) lamented that the performance of students in statistics for the past decades is not encouraging. The WAEC Chief Examiner’s Report of 2020 also pointed out that students lack in-depth knowledge to deduce meaning of statistical problems.

Arising from the above, it is obvious that despite the importance of mathematics in terms of manpower, security, national progress and economy as a whole, as well as government determination to improve students’ success in mathematics, the students’ achievement in mathematics continued to decline. Invariably, there are factors affecting students’ achievement in mathematics (Eriba, Garba, Adejoh & Okwara, 2021). Imasuen and Stanley (2022) maintained that a student’s achievement in a given examination is typically appraised by numerous characteristics other than the student’s factor. According to Agu and Samuel (2018) and Eriba and Samuel (2018), low achievement of students in mathematics is due to the approaches of teaching that teachers employed. As recommended by the Federal Republic of Nigeria (FRN) (2014) the student-activity-based teaching method should be adopted in mathematics instruction.



From the foregoing, it is clear that teachers of mathematics need to adopt new teaching strategies that will facilitate effective mathematics instruction. Jimin (2018) supported that one way of addressing this dilemma is to adopt the collaborative learning approach to teaching. This could be possible as students help one another in a social setting. Collaborative learning encompasses all the strategies that engage the students in small groups or large groups, usually aimed at comprehension and finding solutions that will result in creating a product (Nogata & Ronkowski, 1998 in Chiason 2018). Collaborative learning thus signifies a shift from the typical teacher centered approach in a classroom; hence, it enables the students to work either in small groups or large groups to accomplish a specific task. Explicit teaching strategy on the other hand is the method of teaching that will address the challenges of effective teaching and learning of mathematics (Agu & Samuel, 2018). Explicit teaching strategy is a way to teach concepts by explaining them clearly to students, leaving no room for doubts. Teachers usually dominate in this teaching strategy since they determine what is presented to students without creating room for learners' inputs.

Problem Statement/Justification

The knowledge of statistics in mathematics is necessary for fruitful and stable humans on this planet. The importance of statistics include making a comparison between present and past data possible, explaining facts by revealing quantitative uniformities and relations between facts, and describing facts precisely through convenient presentation of facts and data among others (Emaikwu, 2012). Yet, the achievement of students in statistics in mathematics in Nigeria is generally below the expectation, as reflected in the Chief Examiner's report on Question 9 of 2015 General mathematics paper 2, where he reported that most of the candidates did not recognize the data was a discrete data and they drew grouped frequency instead of a discrete one. Students' interest in statistics is very low as can be visibly observed by students in the tertiary institutions as they show low interest in statistics and research related courses as can be seen in the results of EDU 323 Research Methods in Education and Statistics, a 300 level course for undergraduates of the Centre of Undergraduate Studies of the College of Education Katsina-Ala in Affiliation with the University of Calabar 2020/2021 Academic session, where the percentage pass was less than 50%. Most students continue to experience difficulty in handling questions in statistics and as a result develop fear and hatred for this branch of mathematics. Collaborative learning approach and explicit teaching strategy has been reported to be effective in other subject areas like biology and home economics. The researcher therefore examined to find out if collaborative learning approach and explicit teaching strategy could improve students' motivation, achievement, and retention in mathematics, and which of the approaches is more appropriate to be applied.



Objectives of the Study

The general objective of this research work is to determine the effect of using the collaborative learning approach on students' motivation, achievement and retention in mathematics. Specifically, the research:

- i. Determine the mean achievement scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy.
- ii. Determine the mean retention scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy.
- iii. Examine the motivation scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy.

Research Questions

- i. What are the mean achievement scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy?
- ii. What are the mean retention scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy?
- iii. What are the motivation scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy?

Hypotheses

- i. **Ho1:** There is no significant difference in the mean achievement scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy.
- ii. **Ho2:** There is no significant difference in the mean retention scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy.
- iii. **Ho3:** There is no significant difference in the motivation scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy.



LITERATURE/THEORETICAL UNDERPINNING

The Concept of Collaborative Learning Approach

Collaborative learning connotes various instructional strategies that engage students, or students and teachers, in sharing their intellectual efforts ranging from small or large groups' projects to more specific forms of group work (Nagata & Ronowski, 1998). Dillenbourg and Baker (2016) viewed collaborative learning as a situation where the students involved are of the same level, capable of performing equivalent tasks, having the same target and working as a team. The act of working as a team in an intellectual collaboration usually creates an enabling environment that increases the efficiency of the system and consequently sustains interest and provides more natural learning habits (Jimin, 2018). As Piaget pointed out in his theory of learning, collaborative learning has a major role in constructive cognitive development.

Learning Benefits of Collaborative Learning Approach

The benefits of collaborative learning approach are:

- i. Development of higher-level thinking and active learning.
- ii. Development of leadership and self- management skills.
- iii. Improvement of a wider range of knowledge and skills acquisition.
- iv. Improved and better retention skills.
- v. Establish group goals and values.

Implementation of Collaborative Learning in a Mathematics Class

Collaborative learning enhances critical thinking that results in a higher level of cognitive thinking skills development (Totten, Sills Digby & Russ, 2018). Therefore, given that mathematics class requires improving critical thinking and problem solving skills, collaborative learning can be useful if the teacher considers the following features:

- i. The class should be interactive. The interaction on its own stands a chance of boosting the problem solving situation in a mathematics classroom.
- ii. Students in a mathematics collaborative classroom should be able to do everything together. Communication should be synchronous.
- iii. Mathematics collaborative class should be negotiable. This implies that members of the group may negotiate in an attempt to convince rather than imposing ideas.



Roles of Students in Collaborative Learning

Johnson, Johnson and Holabee (1994) outlined the role of students in a collaborative classroom to include:

1. Minimizing noise level in the group.
2. Giving encouragement to group members in order to achieve the desired goal.
3. Equal participation of members so that all members would contribute for effective results.
4. Writing down significant information that would be for the student in a long time.
5. Report to the rest of the class on the achievement of each group on the ongoing task should be given at the end of each topic.

Roles of a Teacher in Collaborative Learning

For collaborative learning to effectively take place, the teacher should determine the question to be probed. The students are then divided into groups using suitable criteria. Each group is then assigned a particular role. The teacher by now explains the academic assignment to the students and how to go about it. He monitors to see that each student is actively participating in the group and controls the students moving from their assigned groups to other groups of their choice. At the end of the class, the teacher evaluates the groups' achievements, advises on how to make improvement and rewards group members.

Concept of Explicit Teaching Strategy

Explicit instruction is a method to teach in a straight and organized way. This means that explicit teaching or instruction is a teaching method where the teacher gives a clear instruction to students from the front of the class and the students follow to execute a task. Ashman (2021) acknowledged that in explicit learning, the teacher vividly explains the topic for the students to understand rather than having students discover the information for themselves. Natalie (2021) was emphatic that students learn best from explicit instruction. Olagunju and Babayemi (2014) insisted that the explicit teaching approach stimulates learning in science classrooms as it improves performance of students in science. John (2023) reaffirmed that explicit mathematics instructions have been largely employed to promote active learning process.

Alphonse and Leblanc (2014) outlined the steps to be employed in the implementation of explicit instruction during the lesson as the instructor has to demonstrate to students what they must do, which is termed *modeling the practice*, and then guides students through a group activity, which is known as *guided or directed practice* so that the students can have the necessary skills to complete the task. Then, the students practice the task independently, which is called *autonomous practice*.



Steps Taken to Organize Explicit Teaching Strategy

1. A teacher sets specific learning objectives for a class with accurate success standards.
2. The teacher reveals to the learners what to do and how to do it, with practical illustrations.
3. The teacher assesses the students' understanding periodically. That is, the teacher reassesses what transpired during the lesson and summarizes the lesson in order to determine the level of students' understanding and learning.
4. The students are independently provided with the content of an ongoing task to complete the work.

Benefits of Explicit Teaching Strategy in the Classroom

1. **Fast-tracked Performance:** Given that explicit teaching strategy takes learning beyond repetition and memorization to sequence learning for the students, it is effective in fast-tracking students' performance.
2. **Increased Flexibility:** The utilization of video content, which is part of explicit teaching, can be a tremendous opportunity for learners to revisit beyond the classroom.
3. **Clear Expectations:** Explicit teaching involves setting the scene for each lesson or session, reviewing previous lessons, thereby stating aims and objectives for moving forward, which gives clear expectations for students to follow.
4. **Systematic and Sequential:** Explicit teaching is always coherent since it directly guides practice using systematic and sequential steps, which is appropriate for teaching practical or hands-on skills, rather than more abstract concepts.

Empirical Studies

Anuradha (2005) in a study titled "individual learning versus collaborative learning" examined the effectiveness of individual learning and collaborative learning in enhancing drill and practice skills and critical thinking skills. The findings of the study showed that students taught using collaborative learning performed significantly better on critical thinking tests than students who studied individually. However, the above empirical work compared students' achievement between individualized and collaborative learning while this study established the effect of collaborative learning on students' motivation, achievement and retention in statistics in mathematics instead of drill and practice.

A study titled *Effect of Collaborative Teaching on Students' Achievement and Retention in Geometry in Benue State Education Zone B*, carried out by Jimin (2010), found that students taught using collaboration had higher mean achievement and retention scores than those taught using conventional methods. Thus, the above empirical study inspired this research as any tried intervention programme in teaching of mathematics is seen as timely and welcomed.



Amua and Kur (2019), in a study titled impact of explicit teaching on students' motivation and retention in mathematics in Kwande Local Government Area of Benue State, reported that students taught using the explicit method had higher motivation mean score than those taught using the conventional lecture method. Nevertheless, this study compares two strategies to ascertain the one that is more effective on the variables of motivation, retention and achievement.

Many researchers, such as John (2023), submitted that students taught using the Explicit Mathematics Instruction approach were effective in facilitating significant improvements in their academic achievement and motivation in Mathematics. On the contrary, the study by Olom, Imoko and Chianson-Akaa (2023) found that there was a significant difference in the mean self-concept ratings of students taught with collaborative instructional strategy and discussion methods. Eriba, Garba, Adejoh and Okwara (2021) concluded that the use of collaborative instructional approach improved students' achievement more than the conventional method.

METHODOLOGY

The study was conducted in Benue State, North Central geopolitical zone, Nigeria. Benue State was created in 1976 with Makurdi as the headquarters. The state had a population of 4,253,641 in the 2006 census. Quasi-experimental research design was adopted in the study. The population of the study comprises 36,286 Senior Secondary School One (SS1) students enrolled in the 749 secondary schools in the state at the time of this study (Source: Benue State Teaching Service Board Statistics Unit 2024). A sample of 180 students was selected for this study using simple random sampling technique; however, each of the selected schools was a co-educational school.

The two instruments employed for data collection were a 30-item multiple choice objective Mathematics Achievement Test (MAT) used for both achievement and retention and a 25-item Mathematics Motivation Inventory (MMI) drawing information from students concerning their feeling towards statistics in mathematics. The MAT has four options (A, B, C and D) whereas MMI has 25-items 4-point Likert-type rating scale with 4 response options ranging from Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). One mathematics teacher from each of the selected schools became a research assistant when they were trained by the principal researcher on how to teach mathematics (statistics) using the collaborative teaching approach and the explicit teaching strategy. After their training, the teachers administered the treatment on students for a period of four weeks.

Three experts, two in mathematics education and one in measurement and evaluation, have done face validation of the instruments (MAT & MMI). The Kuder-Richardson ($K-R_{(21)}$) was used to estimate the internal consistency (reliability) as 0.88 for MAT and Cronbach Alpha was used to estimate the reliability and a Cronbach Alpha value of 0.86 for MMI was found reliable. The pre-test for MAT and MMI was administered before treatment and a post-test for MAT and MMI was administered after the treatment. MAT takes a maximum of 100%. The scores from the Pre-MAT serve as covariates. Mean and standard deviations were employed to answer the research questions while Analysis of Covariance (ANCOVA) was employed in testing the hypothesis at 0.05 level of significance.



RESULTS/FINDINGS

Research Question One

What are the mean achievement scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy?

Table 1: Mean Achievement Score of Students Taught Mathematics with the Collaborative Learning Approach and Explicit Teaching Strategy (n = 180)

S/N	Method	N	Pre-Test		Post-Test		Mean Gain
			Mean	Std.	Mean	Std.	
1	Collaborative learning approach	90	39.62	13.121	52.56	19.907	12.94
2	Explicit teaching strategy	90	38.60	8.411	46.44	12.279	7.84
	Mean Difference		1.02		6.12		5.1

Source: Author's Computation, 2024 Using SPSS Version 27

The result in Table 1 above shows that the collaborative learning approach has a mean gain of 12.94 which was more than the explicit teaching strategy with a mean gain of 7.84. This implies that collaborative learning approach was more effective in improving students' academic achievement in mathematics than explicit learning strategy. The wide spread of scores was responsible for standard deviation values being far from the mean.

Hypothesis One

There is no significant difference in the mean achievement scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy.

Table 2: ANCOVA Results of the Mean Achievement Scores of Students Taught Mathematics with the Collaborative Learning Approach and Explicit Teaching Strategy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1787.551 ^a	2	893.775	3.256	.041	.035
Intercept	28637.788	1	28637.788	104.338	.000	.371
Pre-Test	106.995	1	106.995	.390	.533	.002
Methods	1637.674	1	1637.674	5.967	.016	.033
Error	48581.449	177	274.471			
Total	491414.000	180				
Corrected Total	50369.000	179				

Source: Author's Computation, 2024 Using SPSS Version 27

The result in Table 2 shows $F(1, 177) = 5.967$ with a p-value of 0.016, which was less than 0.05 alpha level of significance. Therefore, hypothesis one was rejected. By implication, there was a significant difference in the mean achievement scores of students taught mathematics with collaborative learning approach and explicit teaching strategy in the study area. The partial Eta



squared of 0.033 obtained for the methods showed that 3.3% of the mean achievement scores of students was due to the methods used in teaching mathematics.

Research Question Two

What are the mean retention scores of students taught statistics in mathematics with the collaborative learning approach and explicit teaching strategy?

Table 3: Mean Retention Scores of Students Taught Mathematics with the Collaborative Learning Approach and Explicit Teaching Strategy (n = 180)

S/N	Method	N	Post-Test		Retention Test		Mean Gain
			Mean	Std.	Mean	Std.	
1	Collaborative learning approach	90	52.56	19.907	52.48	18.570	0.08
2	Explicit teaching strategy	90	46.44	12.279	37.97	9.815	- 8.47
	Mean Difference		6.12		14.51		

Source: Authors' Computation, 2024 Using SPSS Version 27

Table 3 indicates that students taught mathematics with the collaborative learning approach had a mean gain retention of 0.08 which was higher than the explicit teaching strategy students with a mean gain retention of -8.47. Thus, the widely spread scores in the two groups were accountable for the standard deviation values still being far from the mean.

Hypothesis Two

There is no significant difference in the mean retention scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy.

Table 4: ANCOVA Results of the Mean Retention Scores of Students Taught Mathematics with the Collaborative Learning Approach and Explicit Teaching Strategy

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	16703.687 ^a	2	8351.844	46.142	.000	.343
Intercept	12237.282	1	12237.282	67.608	.000	.276
Posttest	7227.932	1	7227.932	39.933	.000	.184
Methods	6428.270	1	6428.270	35.515	.000	.167
Error	32037.424	177	181.002			
Total	416850.000	180				
Corrected Total	48741.111	179				

Source: Author's Computation, 2024 Using SPSS Version 27

Table 4 reveals that $F(1, 177) = 35.515$; $p = 0.000 < 0.05$. Consequently, Hypothesis Two was rejected. By implication, there was a significant difference in the mean retention scores of students taught mathematics with collaborative learning approach and explicit teaching strategy. The partial Eta square of 0.167 obtained for the methods indicated that 16.7% of the students' mean retention scores in mathematics was due to the methods adopted in teaching mathematics.



Research Question Three

What are the motivation scores of students taught mathematics with the collaborative learning approach and explicit teaching strategy?

Table 5: Mean Motivation Score of Students Taught Mathematics with the Collaborative Learning Approach and Explicit Teaching Strategy (n = 180)

S/N	Method	N	Pre-Motivation		Post-Motivation		Mean Gain
			Mean	Std.	Mean	Std.	
1	Collaborative learning approach	90	2.86	.439	3.10	.949	0.24
2	Explicit teaching strategy	90	2.70	.550	2.73	.942	0.03
	Mean Difference		0.16		0.37		0.21

Source: Authors' Computation, 2024 Using SPSS Version 27

Table 5 reveals that students taught mathematics with the collaborative learning approach had a mean gain motivation of 0.24 which was higher than the explicit teaching strategy students with mean gain motivation of 0.21.

Hypothesis Three

There is no significant difference in the motivation score of students taught mathematics with the collaborative learning approach and explicit teaching strategy.

Table 6: ANCOVA Results of the Motivation Score of Students Taught Mathematics with the Collaborative Learning Approach and Explicit Teaching Strategy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Squared	Eta Squared
Corrected Model	30.793 ^a	2	15.397	19.747	.000	.182	
Intercept	4.974	1	4.974	6.380	.012	.035	
Pre-Motivation	20.993	1	20.993	26.924	.000	.132	
Methods	5.667	1	5.667	7.269	.008	.039	
Error	138.007	177	.780				
Total	1648.000	180					
Corrected Total	168.800	179					

Source: Author's Computation, 2024 Using SPSS Version 27

Table 6 shows that $F(1, 177) = 7.269$; $p = 0.008 < 0.05$. Accordingly, Hypothesis Three was rejected. By implication, there was a significant difference in the motivation score of students taught mathematics with collaborative learning approach and explicit teaching strategy. The partial Eta square of 0.039 obtained for the methods revealed that 3.9% of the motivation score of the students in mathematics was due to the methods adopted in teaching mathematics.



DISCUSSION

Results indicated that there was a significant difference in the mean achievement score of students taught mathematics with collaborative learning approach and explicit teaching strategy. The findings of the study are consistent with that of Jimin (2010); Olom, Imoko and Chianson-Akaa (2023); and Eriba, Garba, Adejoh and Okwara (2021) who found that the use of collaborative instructional approach improved students' achievement more than the conventional method.

Furthermore, results established that there was a significant difference in the mean retention score of students taught mathematics with collaborative learning approach and explicit teaching strategy. The findings resonate with that of Jimin (2010) who reported that students taught with collaborative learning have higher mean retention scores than those taught with conventional methods.

Similarly, results have proven that there was a significant difference in the motivation score of students taught mathematics with collaborative learning approach and explicit teaching strategy. This finding is in tandem with that of Amua and Kur (2019) and John (2023) that students taught with the explicit method have a higher motivation mean score than those taught with other methods.

IMPLICATION TO THE RESEARCH AND PRACTICE

In view of the findings of this study, it is eminent that the findings of this study are very important for teaching and learning mathematics in the following ways:

- i. Most of the mathematics teachers are still searching for teaching strategies that can be adopted in teaching topics relating to statistics in mathematics. Therefore, mathematics teachers will be encouraged by the findings of this study to use collaborative mathematics instruction as an instructional strategy to help the learners improve both in collaborative and independent practices.
- ii. Given that curriculum planners are always looking for new teaching approaches that can facilitate the delivery of mathematics instructions, the outcome of this research may help curriculum planners to encourage the schools to adopt the collaborative learning approach since it stimulates practical learning and the spirit of team learning.
- iii. Finally, the outcome of the study may create the knowledge of the usefulness of collaboration and use of collaborative strategy as an effective and efficient method in teaching and learning mathematics.



CONCLUSION AND RECOMMENDATIONS

This study concluded that the collaborative learning approach improved students' motivation, achievement and retention in mathematics more than the explicit teaching strategy. This has also been reflected in the students' retention ability when taught mathematics using the collaborative learning approach. The collaborative learning approach has further proven that it increases the motivation in learning mathematics than explicit teaching strategy.

The study recommended that mathematics teachers should use the collaborative learning approach given that it presents an opportunity for students to learn with their mates by sharing the ideas among themselves and gain practical experience, which increases their level of motivation, achievement and retention in mathematics. On the other hand, the Ministry of Education should fast-track the process of incorporating the collaborative learning approach in subjects like mathematics for effective teaching and learning of the subject.

FURTHER RESEARCH

Considering the nature of this study, which is very critical for improvement in the teaching and learning of mathematics, it is recommended that this kind of the study should be carried out in other states in Nigeria and even beyond in order to fully establish the best method that can be adopted in the teaching and learning of mathematics that can motivate students to study the subject and improve their achievement and retention.

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