

IMPACT OF SCAFFOLDING STRATEGY ON STUDENTS' ACHIEVEMENT IN AND ATTITUDE TOWARD ALGEBRA AT SENIOR SECONDARY SCHOOLS

By

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Abstract

This study investigated the impact of scaffolding strategy on students' academic achievement in and attitude toward Algebra at senior secondary school level in Ogun State. As a quasi experimental study which comprised of SS II students in Ogun State, 192 students in Four Intact classes were involved in the study and adopted 2x2 factorial design consisting of the 2 levels of instructional strategies and 2 levels of gender. A-50 item multiple choice Achievement Test on Algebra (ATA) and 20 items Altitudinal Questionnaire in Algebra (AQA) were administered on the selected sample, where the exercise lasted for 12 weeks. Both ATA and AQA were subjected to reliability test using the KuderRichardson's formula $K-R 21$ and Cronbach's Alpha with r -value found to be 0.93 and 0.78 respectively. Data analysis was done using Mean, Standard deviation, Multivariate Analysis of Covariance (MANCOVA) and Multiple regression at $\alpha = 0.05$ level of significance. The findings revealed that; there is significant difference in the achievement of students taught Algebra using scaffolding strategy and those taught with conventional teaching method, there is significant difference in the students' attitude toward Algebra taught using scaffolding strategy and those taught with conventional teaching method. Based on the findings, it was recommended that scaffolding strategy should be introduced to lessen persistent academic dismal outings of students in Mathematics in the Nigeria senior secondary schools.

Keywords: *Algebra, Performance, Scaffolding.*

Introduction

Mathematics is a body of knowledge needed for the accomplishment of a technological nation. According Hudoyo (2003), the value of Mathematics as a Science and a tool is inextricably linked to the preparation. Mathematics, as a science, may be defined as knowledge gained through hierarchical, deductive, axiomatic, correct, formal, and abstract reasoning while it may also be seen as a tool for creating methods of thinking for everyday life and explaining the phenomena of coping with technological and scientific development. As a result, it is obvious that the implementation procedure of mathematical learning at all level of education necessitates an attention in wide-ranging manner. The focus attention could not be separated from the three interrelated components of teachers, students, and materials/content.

Mathematics is particularly concerned with reasoning that leads to problem solving, procedures, and ideas (Yakub & Prof, 2019). Many elements impact the success of this

activity, thus while teaching Mathematics, one should employ teaching methods, strategies and instructional resources that are more productive in eliciting acceptable responses from the complex activity (Ahumaraeze & Ekwueme, 2019). The nature and quality of instructional materials, teacher pedagogical abilities, subject presentation, student motivation and learning environment are all key factors to consider when attempting to ensure quality in teaching and learning of Mathematics

Mathematics is an essential subject for teachers, students and society. Mathematics fostered individual scholarly qualities, such as discovery, thought, reasoning, originality, induction, interpretation and creativity. Despite the centrality and importance of mathematics to academic advancement of students, there are still many challenges which have resulted in unstable performance in senior secondary school certificate examination (Iroko, 2022).

To realise the objectives of teaching Mathematics at any level of the educational system in the Society, there is need to make learning of Mathematics attractive and meaningful to the students by presenting it to them in such a way that relate to their previous experiences and lead them to developing new one (Olaoye & Iroko, 2018). The themes of the current Mathematics curriculum for senior secondary school shifted from former six-pronged themes to five-pronged themes as follows: Number and numeration, Algebraic processes, Geometry, Statistics and Introductory calculus (NERDC 2007). According to Iroko and Olaoye (2021) Algebraic processes act as relating link between mathematical themes.

Algebra deals with these operations and can be considered as generalised Arithmetic. Algebra is a subset of mathematics that uses letters in place of numbers to solve problems (Iroko & Olaoye, 2021). Addition, subtraction, multiplication and division are arithmetic operations that help to solve mathematical problems. Algebra is one of the themes where students struggle most as a portal to mathematics (Usman & Musa, 2019).

We come across expressions involving quantities such as 2 chairs, 5 tables, 4 books, 3 men, ₦ 7 etc. If we take a, b, c, d and e to represent a chair, a table, a man and one naira respectively, then we have the following expressions representing the above quantities. $2a$, $5b$, $4c$, $3d$ and $7e$.

We can also have combinations of these expressions such as.

1. Add 2 chairs to 5 tables (or 2 chairs plus 5 tables) will be represented by $2a + 5b$.
2. From 7 books take away 3 books (or 7 books minus 3 books) will be represented by $7c - 3c$.
3. 4 chairs plus 2 tables minus 3 books is represented as $4a + 2b - 3c$ and many other types.

These expressions and their combinations are called Algebraic expression. They are in turn connected with equality sign to form other Algebraic statement such as $2a = 5$, $3x + 5y = 8$, $6b + 4c = 12$, $x^2 + 2x = 5$ etc. These statements are called Algebraic statements.

Academic achievement is the quality of students' scores in an examination or a test when compared with that of others of the same level (Iroko, 2022). It is the quality of students' result that is reflected in their result or examination (Ginga, Muhammed & Usman, 2019). Attitude could be said to be the overviews, outlooks and response patterns toward a situation, school activities or subject (Ezeudu & Gbendu, 2018). Attitudes are not inborn

trait but are rather learnt, adapted or adopted and developed based on surrounding circumstances (Jana & Patra, 2017). Students' attitudes towards learning are different in many ways. Some students attitude enable them to achieve their learning objectives by dealing with challenges and obstacles while some have attitudes that slow them down or stop them to achieve their learning objectives (Abdullah & Nor, 2020). Akinsola and Olowojaiye (2008) asserted that students' attitude towards a subject determine their accomplishment in that subject. According to Akinoso (2016) Attitude towards mathematics has been considered a significant factor that influence students participation and success in Mathematics and particularly, the instructional strategies adopted by the teacher may strengthen students need in order to increase their attitude.

According to Ginga, Muhammed and Usman (2019) research evidences revealed that low students performance in mathematics is due to a lack of teaching materials, usage of appropriate teaching approach, mathematics phobia, and inadequate teaching facilities which comprise instructional materials and equipment for effective teaching. Mcguire (as cited in Joefel, 2014, p. 14) highlighted three potential elements causing mathematics underachievement; the teachers' component which is made up of classroom management, subject matter mastery, communication skills, personality and instructional techniques. The second aspect is the students' factor which comprises time management, study habits, attitude and enthusiasm in mathematics. Environmental elements such as educational setting, parents, morals, attitude and peer group make up the third category. Joefel (2014) stated that teachers are often the main contributors to student accomplishment and that they should go beyond the students and help them create critical thinking analyses. Teachers should be able to reach beyond students' expectation. In light of this, teaching strategies that highlight practical approaches of teaching and learning that adapts critical thinking in the active learning environment are required in mathematics. One of such strategies is scaffolding strategy.

Scaffolding is a term that refers to a technique or a set of approaches employed during a learning process in order to maximise achievement, understanding and output (Aditi, 2017) with the goal of achieving educational objectives. It is a temporary, organised, and gradual support provided by the teacher to students in order to help them achieve a higher level of comprehension and skill development that they would not be able to achieve on their own. Scaffolding aids students in completing various tasks. Scaffolding has three key characteristics: it is a collaborative and effective interaction between the learners and the teacher; it works in the learner's Zone of Proximal Development (ZPD); and it is a temporary support that is gradually eliminated once the goal is reached. Scaffolding can be thought of as a temporary framework that supports a building in the process of being built. The scaffolds are removed once the construction is robust enough to stand on its own.

The term "scaffolding" was used as a metaphor to stand for the type of learning support provided by a peer or teacher to support learning (Lombardi, 2019). Scaffolding is a provisional, organised, and progressive support provided by a teacher to students to assist them in acquiring new skills that they would not be able to learn on their own. Scaffolding, according to Benson (1997) is a connection that students utilise to link what they already

know to something they don't know. When used correctly, Scaffolding will serve as an enabler rather than a disabler. In the 1970s, Jerome Bruner coined the term "scaffolding" in the context of education. It refers to the adult-to-learner interactional educational relationship that enables a novice or students to solve a problem beyond his or her own efforts (Wood, Bruner & Ross, 1976). The teaching technique of instructional scaffolding emphasises the teaching of new abilities by involving students in collaborative projects that would be excessively difficult for them to do on their own (Joda, 2019).

In the classroom, scaffolding could include modelling behaviours, coaching and prodding, conversation with questions and answers, thinking aloud, planned and spontaneous dialogues, and other interactive planning or design aids to help the student transcend a cognitive gap (Ahmad, 2016).

Intrinsic in scaffolding instruction is Lev Vygotsky's (1978) scheme of the zone of proximal development (**Lombardi, 2019**). Vygotsky(1978) suggests that:

“There are two parts of a learner’s developmental level: the actual developmental level and the potential developmental level. The zone of proximal development is “the distance between the actual developmental levels as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers” (p. 86).

The actual developmental level has been extended and the ZPD has shifted after the learner has lengthened his/her knowledge. The ZPD is always change as the students expand and gain knowledge, so scaffolded instruction must frequently be individualised to address the changing ZPD of each student.

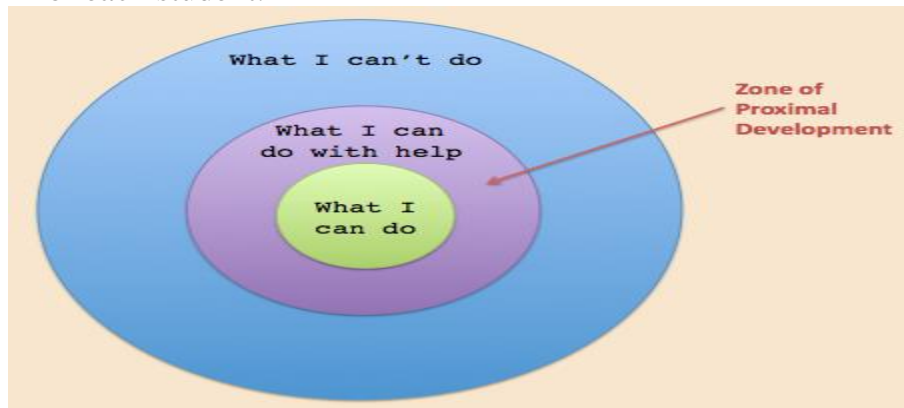


Figure 1: Vygotsky ZPD model (Lombardi, 2019)

Characteristics and Critical Features of Scaffolded Instruction

There will be particular identifiable elements in place in an adequate scaffolding procedure to allow facilitation of supporting the learner in internalising the knowledge until mastery happens. These five characteristics are identified by Applebee and Langer (1983), as cited by (Lombardi, 2019):

- **Intentionality:-** The task has a distinct overarching goal that guides every individual behavior that contributes to the overall goal.

- **Appropriateness:-** Instructional tasks provide difficulties that can be handled with support but that students are unable to solve on their own.
- **Structure:-** Questioning and modeling activities are organised around a model of satisfactory task methods and lead to a natural flow of ideas and language.
- **Collaboration:-** When a teacher responds to a student work, he or she recasts and expands on the students' efforts rather than dismissing what they have produced on their own. The primary task of the instructor is collaborative rather than evaluative.
- **Internalisation:-** As the pupils internalise the patterns, external scaffolding for the task is gradually removed.

Muhammed (2019) posited that in order to carry out scaffolding strategy, the teacher must first identify and find out:

- i) What students can achieve on their own
- ii) What students can achieve with guidance (that is, the teacher determines the zone of proximal development of students)
- iii) The teacher then provides the instructions that are just enough to support the learner in task beyond reach without teacher's support.

The term "conventional teaching method" refers to the most common teaching method utilised in schools by teachers to teach students (Iroko, 2022). Because all activities are directed by the teacher, students are considered as passive receivers of knowledge during the teaching/learning process.

Statement of the problem

Many students find it hard to understand mathematics and often fail to succeed through their learning. This could be because they do not build an adequate understanding of essential mathematics ideas. Reports from the WAEC Chief Examiners (Mathematics) from May/June 2010 to May/June 2019 SSCE show the weaknesses of students in Algebra theme ranging from word problems leading to simple linear equation, algebraic graph, reading/answering from the graph, interpretation/solution to word problems, translation of word problems into mathematical expressions, inequality and graphical solutions to quadratic equations.

Algebra as a link between themes in mathematics is one of the subjects in which students struggle the most. Understanding Algebra and appropriately applying it to everyday problems benefits both individuals and nations. Despite the importance of Algebra in the evolution of science and current efforts in mathematics education, students continue to struggle with the subject (Usman & Musa, 2019). Meanwhile, due to students' low Algebra performance, Algebra literacy learning and teaching in schools seems to necessitate a variety of interactive tasks, approaches, and instructional strategies (Azuka, Jekayinfa, Durojaiye & Okwuoza, 2013).

The ways students are taught greatly affect their performance and one of the factors responsible for students' underperformance in Mathematics is associated with the method of instruction. Therefore, a study towards adopting an alternative method of teaching is necessary in order to proffer solution to underperformance of students in Mathematics.

In recent years however, evidences abound showing that teaching students with an effective instructional strategy could significantly improve their performance (Aditi, 2017; Yaghmor, 2016; Nwoke, Iwu & Izoma 2015). Review of related research showed that little have been done on using Scaffolding instructional strategy to teach Mathematics themes. It is in view of this that the researcher decided to investigate the effect of Scaffolding strategy on students' performance in Algebra at the senior secondary school level in Ogun State.

Research Questions

1. Is there a difference in the achievement of students taught Algebra using scaffolding strategy and those taught with conventional teaching method?
2. Is there a difference in the students' attitude toward Algebra taught using scaffolding, strategies and those taught with conventional teaching method?

Null Hypotheses

H₀₁ There is no significant difference in the achievement of students taught Algebra using scaffolding strategy and those taught with conventional teaching method.

H₀₂ There is no significant difference in the students' attitude toward Algebra taught using scaffolding strategies and those taught with conventional teaching method.

Methodology

The study adopted a quasi-experimental pre-test, post-test, non-equivalent control group design. The study population for study comprised public senior secondary schools in Ogun State. The population includes both male and female students and other members of government-owned senior secondary schools in Ogun State. Simple random sampling technique was used to select two blocs out of the four education blocs in Ogun State while four government-owned senior secondary schools were randomly selected for the study. Two schools each were assigned to the treatment group and control group. The treatment group received treatment based on scaffolding strategy while the control group was taught using conventional teaching method, both groups covered the same content material which lasted for 12 weeks. One arm in each of the sampled schools was used and intact class was adopted for the study since random assignment of the students' to the groups was not achieved.

Students in treatment group were exposed to scaffold instructional strategy. Instructional scaffold is a temporary support structure faculty put in place to assist students in accomplishing new tasks and concepts they could not typically achieve on their own. Once students are able to complete or master the tasks, the scaffolding is gradually remove or fades away. Prior to the commencement of the treatment, students were informed about the structure of scaffolding by the facilitator and they participated in pre-achievement test and pre-attitude test. During the treatment, the facilitator introduces the topic and then presents the content of the lesson with examples to the students. The facilitator writes another example on the board and solves it together with the students. The facilitator groups the students into small groups and writes another example on the board for each of the group to solve it together within the groups. Lastly, he writes the questions on the board and asks students to solve them individually. The facilitator monitors directly, while providing

scaffolding bridging and offering explanations. Facilitator with scaffolding building scheme (dependently on the student understanding of the topic at the time) watching carefully and gives directions. After the treatment, students participated in the post-achievement and post-attitude test individually.

Achievement Test in Algebra (ATA) and Attitude questionnaire in Algebra (AQA) were the instruments used for the study. ATA is A-50 items multiple choice questions on selected topics in Algebra with four options that comprised three distracters and one key while was developed by the researcher to elicit information from the students on their attitude towards Algebra. The AQA is made up of two sections A and B. Section A collected information on students demographics while section B comprised 20 items which requested students to signify their attitude towards the study of algebra based on four point modified Likert scale of Strongly Agree, (4), Agree (3), Disagree (2) and Strongly Disagree (1). The instruments were administered to both treatment and control groups before and after the intervention. The instruments were given to experts in Mathematics Education for some structural adjustments and corrections to enhance the final construction ahead of administration. The instruments; ATA and AQA were subjected to reliability test using the KuderRichardson's formula K- R 21 and Cronbach's Alpha with r-value found to be 0.93 and 0.78 respectively. This score suggested that the instruments were found to be useful and consistent for the purpose for which they were prepared. The data collected was subjected to statistical tool of Mean, Standard Deviation and Multivariate Analysis of Covariance (MANCOVA) using SPSS with an alpha level of 0.05 was to test the efficiency of treatment group over control group.

Findings

Research Question 1: Is there a difference in the achievement of students taught Algebra using scaffolding learning strategy and those taught with conventional teaching method?

Table 1: Table of Mean and Standard Deviation of Algebra Achievement Scores of Students

Method	Mean	Standard Deviation	N
Scaffolding	28.0991	5.01263	111
Conventional	19.5926	4.83161	81

In the Algebraic Achievement Test post-test, students taught with scaffolding strategy had the higher mean value (Mean = 28.10, S.D = 5.01) whilst the students that were taught with conventional method of teaching had the lower mean value (Mean = 19.59, 4.83) as shown in Table 1. Therefore, the students in treatment group achieved higher than their counterparts in control group. To determine whether the observed difference was significant, null hypothesis 1 was tested.

H₀₁ There is no significant difference in the achievement of students taught Algebra using scaffolding strategy and those taught with conventional teaching method.

Multivariate Analysis of Covariance statistical technique was used to test hypothesis 1 at $p < 0.05$ significance. The MANCOVA results are presented in tables 2 and 3

Table 2: Table of MANCOVA showing the multivariate tests of students' performance

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.351	49.981 ^b	2.000	185.000	.000
	Wilks' Lambda	.649	49.981 ^b	2.000	185.000	.000
	Hotelling's Trace	.540	49.981 ^b	2.000	185.000	.000
	Roy's Largest Root	.540	49.981 ^b	2.000	185.000	.000
PREACHIEVEMEN T	Pillai's Trace	.247	30.375 ^b	2.000	185.000	.000
	Wilks' Lambda	.753	30.375 ^b	2.000	185.000	.000
	Hotelling's Trace	.328	30.375 ^b	2.000	185.000	.000
PREATTITUDE	Roy's Largest Root	.328	30.375 ^b	2.000	185.000	.000
	Pillai's Trace	.073	7.276 ^b	2.000	185.000	.001
	Wilks' Lambda	.927	7.276 ^b	2.000	185.000	.001
	Hotelling's Trace	.079	7.276 ^b	2.000	185.000	.001
METHOD	Roy's Largest Root	.079	7.276 ^b	2.000	185.000	.001
	Pillai's Trace	.441	72.868 ^b	2.000	185.000	.000
	Wilks' Lambda	.559	72.868 ^b	2.000	185.000	.000
	Hotelling's Trace	.788	72.868 ^b	2.000	185.000	.000
	Roy's Largest Root	.788	72.868 ^b	2.000	185.000	.000

The result shows that the Wilks' lambda associated with the overall multivariate analysis of covariance (MANCOVA) is $\lambda = 0.372$; $(F(2,185) = 72.87, p < 0.05)$ confirming the significance of the treatments. This simply means that the multivariate F value shown in Table 2 for the performance scores of students in Algebra have strong statistical value thus justifying deeper probe into the F values relating to the independent variable of scaffolding strategy and conventional teaching method on the dependent variables of achievement and attitudinal scores

Table 3: MANCOVA table of tests of between-subjects of effect of scaffolding strategy on students' performance

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model T	POSTACHIEVEMEN	4565.591 ^a	5	913.118	49.166	.000
	POSTATTITUDE	1942.790 ^b	5	388.558	5.422	.000

Intercept	POSTACHIEVEMEN	449.456	1	449.456	24.201	.000
	T					
PREACHIEVE	POSTATTITUDE	6046.351	1	6046.351	84.376	.000
	T					
MENT	POSTACHIEVEMEN	963.368	1	963.368	51.872	.000
	T					
PREATTITUDE	POSTATTITUDE	377.184	1	377.184	5.264	.023
	T					
METHOD	POSTACHIEVEMEN	12.156	1	12.156	.655	.420
	T					
Error	POSTATTITUDE	1035.290	1	1035.290	14.447	.000
	T					
Total	POSTACHIEVEMEN	2704.190	1	2704.190	145.606	.000
	T					
Corrected Total	POSTATTITUDE	336.685	1	336.685	4.698	.031
	T					
Error	POSTACHIEVEMEN	3454.388	186	18.572		
	T					
Total	POSTATTITUDE	13328.689	186	71.660		
	T					
Corrected Total	POSTACHIEVEMEN	123366.000	192			
	T					
Error	POSTATTITUDE	641590.000	192			
	T					
Total	POSTACHIEVEMEN	8019.979	191			
	T					
Corrected Total	POSTATTITUDE	15271.479	191			
	T					

Multivariate analysis of covariance was applied on the data as random selection of students to the two instructional groups cannot be achieved and intact classes have to be used. The MANCOVA result is shown in Table 3

The F-value associated with Pre-Achievement test was found to be significant. $[F(1,190) = 51.87; p < .05]$. This demonstrates that before the treatment, the students in the two instructional groups had drastically diverse Algebra achievement levels. Table 3 result showed a significant difference in the achievement of students taught Algebra using scaffolding strategies and those taught with conventional teaching method $[F(1,190) = 183145.61; p < .05]$. Therefore, the null hypothesis which states there is no significant difference in the achievement of students taught Algebra using scaffolding strategy and those taught with conventional teaching method is hereby rejected. By implication scaffolding strategy have effect on students' academic achievement in Algebra.

Research Question 2: Is there a difference in the students' attitude toward Algebra taught using scaffolding strategy and those taught with conventional teaching method?

Table 4: Table of Mean and Standard Deviation of Algebra attitude scores of students

Method	Mean	Standard Deviation	N
Scaffolding	57.6937	10.07138	111
Conventional	56.3210	7.09371	81
Total			192

In the post-Attitude test of students as shown in Table 4, students who were taught with scaffolding strategy had the higher mean value (Mean = 57.69, S.D = 10.07), and students taught using conventional method of teaching had the least mean value (Mean = 56.32, 7.09). Therefore, the subjects in treatment group had higher attitudinal scores than the students in control group. To ascertain whether the observed effect was significant, null hypothesis 2 was tested.

H₀₂ There is no significant difference in the students' attitude toward Algebra taught using scaffolding strategy and those taught with conventional teaching method.

The F-value associated with Pre-Attitude test was found to be significant [$F(1,190) = 14.45$; $p < .05$]. This demonstrates that before the treatment, the students in the two instructional groups had drastically diverse attitude toward Algebra. Table 4 results showed a significant difference in the students' attitude toward Algebra taught using scaffolding strategy and those taught with conventional teaching method [$F(1, 190) = 4.69$; $p < .05$]. Therefore, the null hypothesis which states there is no significant difference in the students' attitude toward Algebra taught using scaffolding strategy and those taught with conventional teaching method is hereby rejected. Students in treatment group displayed positive attitude toward Algebra than the students in control group.

Discussion of findings

The study found that the treatment group (scaffolding strategy) has a different effect on students' Algebraic achievement scores than the conventional teaching method. In the posttest of the Algebra achievement test, students who were committed to the scaffolding strategy had the higher mean score while their counterparts exposed to conventional teaching method had a least mean score. The pretest result in Table 2 demonstrates that before the treatment, the students in the two groups were significantly different in Algebra achievement levels. Table 3 shows that students who were exposed to scaffolding strategy improved their achievement levels.

The results for students' Algebra achievement are consistent with some previous findings. When compared to the traditional method, Fatade (2012) found that learner-centered teaching strategies resulted in improved content learning.

Ahmad (2016) observed a significant difference between the mean performance scores of students taught geometry concepts using Scaffolding-enriched Collaborative Strategy (SCS) and those taught using Conventional Teaching Strategy. Corroborating the findings of this study, Etobro (2019); Joda (2019); Muhammed (2019); Bansal (2017) found that there is a substantial difference in performance between students taught with instructional scaffolding approach and those taught using traditional methods in support of scaffolding strategy.

The development of meta-cognitive strategies that enhance meaningful learning has resulted from efforts to; assist learners in learning conveniently, properly engaged during the lesson, promote deeper learning, study in a digital environment with vital tools, reduce

stress, and increase their satisfaction. When correctly employed by teachers to demystify perceived difficult Mathematical ideas, this study found that scaffolding strategy has a tendency to develop learners' meta-cognition.

The results also showed that the treatment group (scaffolding strategy) has a better influence on students' attitudes toward Algebra than the conventional teaching method. Students exposed to scaffolding strategy had the higher mean score in the post attitude test and students taught primarily with conventional teaching method had the lowest mean score. Among other studies that supported effective instructional strategies at influencing students attitude toward Mathematics are Akinoso (2016); Akinsola and Olowojaiye, 2008. The Algebra attitude pretest result in table 2 reveals that the two groups' attitudes toward Algebra were significantly different before the treatment. The post test result in Table 3 on the other hand, showed that students exposed to scaffolding strategy had a better attitudinal level. Bansal (2017) discovered a substantial change in the mean scores of students' attitude toward science in the experimental group before and after the usage of scaffolding teaching technique.

Students' attitudes toward using effective instructional strategy such as scaffolding into the teaching and learning of mathematical ideas had a favourable impact on students' needed Mathematics skills, as well as their learning autonomy and motivation.

Conclusion

The impact of scaffolding strategy on students' Algebra performance was explored in this study. The study's findings revealed that there is significant difference in the achievement of students taught Algebra using scaffolding strategy and those taught with conventional teaching method, there is significant difference in the students' attitude toward Algebra taught using scaffolding strategy and those taught with conventional teaching method. In addition to playing an important part in the achievement of teaching and learning mathematics, Algebra also provides a connection between mathematical topics. Its relevance cannot be over emphasised for everyday activities.

This study had proven that scaffolding strategy have tendency of developing learners meta-cognition when properly used by the teachers to demystify the perceived difficult Mathematical concepts. Therefore, it could be concluded that rather than the conventional teaching method scaffolding strategy can assist learners to learn conveniently, be properly engaged during the lesson, promote deeper learning, reduce stress and increase their satisfaction in senior secondary schools as a mode of learning.

Recommendations

The following recommendations are made in light of the problems highlighted and based on the findings of this study:

1. Secondary school teachers should be urged and encouraged to discard traditional teaching methods, particularly the Algebraic concepts.
2. Educators and teachers of mathematics at all level secondary school should look at using scaffolding strategy as a form of instruction in the classroom.

3. Secondary school mathematics teachers are encouraged to use more activity-based instructional strategy scaffolding strategy which has the potential to improve students' Mathematics performance.
4. Since scaffolding strategy improves Algebra learning, there is a need to better train teachers on how to employ this instructional strategy. Seminars and workshops for Mathematics teachers should therefore be held on a regular basis with the goal of equipping them with the skills and techniques necessary to effectively apply scaffolding, strategy in the teaching and learning of Mathematics.
5. Scaffolding strategy should be emphasised and encouraged in the teaching and learning of mathematics in secondary schools by curriculum planners and policymakers.
6. Government authorities and key players responsible for the country's education system administration and development should make available resources to assist the adoption and implementation of scaffolding strategy in secondary school.

Suggestions for further studies

This study investigated the impact of scaffolding strategy on students' performance in Algebra. Based on the findings of this study, further studies in another population for cross validation are invited to replicate this study.

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