EFFECTS OF DIFFERENTIATED INSTRUCTION ON STUDENTS' PERFORMANCE IN NUMBER AND NUMERATION AMONG JUNIOR SECONDARY SCHOOLS IN SOKOTO STATE, NIGERIA

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Abstract

This study investigated the effects of differentiated instruction on students' performance in number and numeration among junior secondary schools in Sokoto state, Nigeria. The research was motivated by persistent poor performance in Mathematics, particularly in foundational topics like number and numeration, which is largely attributed to traditional teaching methods that fail to address the diverse needs of learners. A quasi-experimental design was adopted, involving 384 JSS II students selected from six public secondary schools across Sokoto North and South education zones. Participants were non-randomized. Thus, intact classes were used to assign experimental and control groups. The experimental group was taught using differentiated instruction strategies, while the control group received conventional (lecture-based) instruction. Data were collected using the Mathematics Achievement Test (MAT), which was validated and pilot-tested with a high reliability index of 0.72. Pre-test and post-test scores were analyzed using mean, standard deviation, and independent t-tests at a 0.05 level of significance. Findings revealed that students taught with differentiated instruction performed significantly better than those taught using a conventional method, with a mean difference of 14.08 in post-test scores. No significant gender difference was found in the experimental group, indicating that both male and female students benefited equally from the differentiated instruction. The study concludes that differentiated instruction is an effective pedagogical strategy for enhancing students' academic performance in number and numeration. It promotes inclusive learning, addresses individual differences, and fosters greater student engagement. In the end, the study recommended that teacher training in differentiated strategies should be deployed when teaching Mathematics.

Keywords: Differentiated Instruction, Number and Numeration, Performance, Junior Secondary Schools, Mathematics Education.
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Introduction

Recently, there has been concern about students' poor performance in Mathematics, particularly in topics such as number and numeration, especially at junior secondary school level (Abasi & Ekwueme, 2025; Chand *et al.*, 2021). Mathematics is often viewed as a straightforward subject, essential for scientific and technological advancement. However, students in many parts of the country, including Sokoto State, still perform poorly in end-of-term examinations conducted under the auspices of the State Ministry of Basic and Secondary Education (Bello *et al*., 2017). One of the reasons for this is the use of teaching methods that do not take into account individual differences among learners. It is therefore necessary to review how strategies like differentiated instruction can improve students' understanding and performance in Mathematics.

Differentiated instruction, as a teaching method, recognizes and responds to the varied learning needs, interests, and abilities of students taught within the same classroom

conditions (Tomlinson & Jarvis, 2023). It is aimed at improving teaching by adapting the content, process, product, or learning environment to suit individual learners' diverse needs. For instance, while some students may grasp number concepts through hands-on activities, others may require visual aids or peer discussion to understand the same topic (Schwichow *et al.,* 2016). According to Onyishi (2024), differentiated instruction encourages inclusive education and can help bridge the performance gap between high and low achievers. This approach is particularly relevant in Mathematics, where concepts can be abstract and require personalized strategies for better comprehension and easy assimilation.

Numbers and numeration form an important part of the secondary school Mathematics curriculum in Nigeria. Topics include place value, number bases, factors and multiples, and fractions (NERDC, 2013). A good knowledge of numbers and numeration provides a solid foundation in other areas of Mathematics like algebra, geometry, and statistics. However, research (i.e) has shown that many students in Nigeria find these concepts difficult because of traditional teaching methods that, for many years, treat all learners the same (Makonye, 2020). This method often leaves slow learners behind and does not challenge exceptional learners. In many Nigerian classrooms, a traditional learning method is still common. Teachers do present lessons without considering learners' different levels of operation, styles of learning, or interests in learning Mathematics (Schulze & Bosman, 2018). This may lead to boredom, confusion, and poor performance, especially in number and numeration.

Musa and Danjuma (2022) suggest that differentiated instruction can solve these problems by making lessons more learner-centered (Zahedi *et al.,* 2023). For instance, teachers can group students according to their performance levels and then give tasks suitable for each group, improving both participation and learning outcomes. Studies confirm that differentiated instruction improves students' performance across all subjects. For example, Olatunji and Ibrahim (2020) found that students taught mathematics using this method performed better than those taught through traditional methods. Similarly, Zakaria and Syamaun (2017) reported that adapting lessons to students' diverse needs made learners more active, confident, and motivated to learn more Mathematics.

However, the use of differentiated instruction in Nigerian schools is still limited. Many teachers lack the training and resources to plan and deliver such lessons confidently (Onyishi, 2022). Furthermore, challenges such as large class sizes, time limits, and poor supply of teaching materials affect its practice in Sokoto and other northern states (Makai *et al.,* 2024; Adamu *et al.,* 2022). As a result, most teachers still rely on the lecture-based method of teaching, which ignores students' differences, and many also lack knowledge of the theories behind differentiated instruction.

For instance, Vygotsky's (1978) idea of the Zone of Proximal Development showed that students learn best when teaching is slightly above their current level, but still within reach with guidance from their social environment. Differentiated instruction supports this idea by giving tailored support (Mais & Yaum, 2025; Goyibova, 2025). Additionally, another theory that supports differentiated instruction is Gardner's theory of Multiple Intelligences, which recognizes that learners may prefer visual, auditory, or kinesthetic methods (Ishartono *et al.,* 2021; Ikawati & Kowiyah, 2021; Susulawati *et al.,* 2019).

Several studies have confirmed the positive effect of differentiated instruction on students' academic performance across subjects. For instance, Bal (2023) and Bal (2016) found that secondary school students taught Mathematics through differentiated strategies performed significantly better than those taught using conventional methods. In another study, Goyibova *et al.* (2025) revealed that when teachers adapted differentiated instructional methods to suit students' diverse needs, learners became more active, confident, and motivated. These findings suggest that differentiated instruction can be a useful tool for improving learning in number and numeration.

Other dimensions of the need for using differentiated instruction are large class sizes, time constraints, and inadequate instructional materials (Lavania & Nor, 2020). As a result, most Mathematics teachers continue to rely on lecture-based teaching methods, which do not cater to students' individual learning differences. Furthermore, according to Vygotsky's (1978) theory of the Zone of Proximal Development, students learn best when instruction is slightly ahead of their current level of understanding but within their capacity to grasp with support. Thus, differentiated instruction aligns with this theory because it involves scaffolding and providing support based on individual needs (Karimi & Nazari, 2021). It is also worth noting that performance in Mathematics is closely associated with future educational and career opportunities. Hence, poor performance in number and numeration at the secondary level can limit students' chances of pursuing science, technology, engineering, and mathematics (STEM) courses in higher education (Gill *et al.*, 2018). Therefore, improving Mathematics instruction through differentiated strategies is not only necessary for academic success but also important for national development and economic empowerment. Although some studies have been conducted on differentiated instruction in Nigeria, very few have focused specifically on Mathematics, and fewer still on number and numeration in Sokoto State. This presents a noteworthy research gap that this study aims to address.

Statement of the Problem

The consistent poor performance of students in Mathematics, particularly in number and numeration, is a major concern for educators, parents, and policymakers in Nigeria. Despite numerous interventions, external examinations such as WAEC and NECO have shown a steady trend of underachievement among secondary school students in Mathematics (WAEC Chief Examiner's Report, 2015 – 2023). Number and numeration, which should serve as the building block for more advanced mathematical topics, remain one of the most poorly understood and feared areas among students. In Sokoto State, many students find it difficult to perform simple operations like converting between number bases or identifying place values, even at the SS1 level. This failure suggests that the way Mathematics is being taught may not be meeting the needs of all learners. One of the major problems is the use of undifferentiated, traditional teaching methods where all students are taught the same content, at the same pace, and in the same way. These teacher-centered approaches do not consider students' diverse learning needs, backgrounds, or readiness levels (Ghafar, 2024). For example, a teacher may use the chalk-and-talk method to teach number bases to a mixed-ability classroom without considering that some students are visual learners who need diagrams or concrete materials to understand the topic. Others may be slower learners who require additional support or extended practice

time. When such students are left behind, they become discouraged and disengaged from learning.

Another challenge is overpopulated classrooms in Sokoto, usually with more than 60 students per teacher. This makes it almost impossible for teachers to identify individual strengths and weaknesses or to apply personalized teaching strategies. In such settings, slower learners are often neglected, while advanced learners are not given enough challenge. This uniform directional style reduces motivation, class participation, and performance. Learning numbers and numeration becomes even harder when students cannot follow the teaching method or classroom pace. Failure in this area also affects progress in other branches of Mathematics, such as algebra, statistics, and probability, which depend on strong number skills. Without this foundation, students grapple with more advanced topics, leading to repeated failure. Such weakness also limits career choices in areas like engineering, information technology, and economics, reducing the number of qualified professionals in these fields.

In addition, poor performance in mathematics affects the confidence and self-esteem of students, especially in northern Nigeria, where some cultural beliefs already discourage female students from pursuing science subjects. When a student repeatedly fails to understand basic topics like number and numeration, they may begin to believe that Mathematics is not meant for them. This psychological barrier becomes more damaging than the academic problem itself. Such learners may avoid Mathematics altogether, even when they have the potential to excel, if given appropriate support and instructional strategies. Differentiated instruction offers a practical solution to many of these challenges, yet it is rarely practiced in public secondary schools in Sokoto State. Teachers either lack the professional training to design differentiated lessons or believe that such strategies are too time-consuming or difficult to implement. There is also a lack of institutional support, such as teaching aids, teacher guides, and small class sizes, to encourage differentiated practices. As a result, the benefits of differentiation, such as increased engagement, better understanding, and improved academic performance, remain unrealized in many schools in the state.

Objectives of the Study

The following are the objectives of the study:

i. To determine the difference in performance between students taught number and numeration using differentiated instruction and those taught using conventional methods.
ii. To determine the gender difference in the performance of male and female students taught number and numeration using differentiated instruction

Research Questions

The following research questions were raised:

i. What is the difference in performance between students taught number and numeration using differentiated instruction and those taught using conventional teaching methods?
ii. What is the gender difference in performance between male and female students taught number and numeration using differentiated instruction?

Null Hypotheses

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

H_{01}: There is no significant difference in the performance of students taught number and numeration using differentiated instruction and those taught using conventional methods.
H_{02}: There is no significant gender difference between the performance of male and female students taught number and numeration using differentiated instruction

Conceptual Review

The concept of differentiated instruction has gained much attention in recent years as teachers search for effective strategies to improve students' performance. Thus, differentiated instruction is a teaching method used to address the diverse learning needs of students by varying what is taught, how it is taught, and how students show what they have learned, so that all learners in the same classroom can succeed (Callahan & Hertberg-Davis, 2017). In Sokoto State, junior secondary school classrooms are filled with students who have different academic abilities, cultural backgrounds, learning styles, and exposure to Mathematics outside school. For example, some students may easily understand number bases, while others need repeated explanations with local examples such as counting in natural numbers or traditional number systems, mostly used for utilitarian purposes (Carver & Klahr, 2001).

Differentiated instruction recognizes these differences and provides flexible teaching methods to ensure that every learner benefits. Numbers and numeration are one of the most basic yet essential concepts in Mathematics. It deals with understanding numbers, their values, and the way they are represented in different bases. At the junior secondary school level in Sokoto State, topics such as place values, whole numbers, prime numbers, and number bases form the foundation for later mathematical learning. Most of the students in Sokoto grapple with these concepts because teachers often use one teaching approach, usually the lecture method, which does not carry every student along. This situation has led to repeated poor performance in classroom exercises, assignments, and external examinations such as those conducted by the West African Examination Council, [WAEC], National Examination Council, [NECO], National Business and Technical Education Board, [NABTE], and GCE (WAEC Chief Examiners' Report, 2023 – 2025; NECO Chief Examiners'

Differentiated instruction can take several forms depending on the needs of the students. Some common strategies include grouping learners based on ability, giving extra materials to fast learners, using practical activities for slow learners, and applying local teaching aids. For example, when teaching number bases in Sokoto

junior secondary schools, teachers can use objects like sticks, stones, or traditional counting systems familiar to the students. This makes the lesson more relatable and easier to understand. As Ahmed (2019) observed in his study of Sokoto classrooms, when teachers use varied examples that reflect students' everyday experiences, learners show more interest and improve their performance in Mathematics. Another important concept related to this study is student performance. In this context, performance means how well students do in understanding and solving Mathematics during tests, classwork, and examinations.

In Sokoto State, performance in Mathematics has often been described as unsatisfactory, especially in junior secondary schools. One of the major reasons for this poor performance is the gap between the teacher's method of teaching and the learner's way of learning. Differentiated instruction tries to close this gap by giving students different ways to learn in the same classroom. Differentiated instruction tries to close this gap by giving students different ways to learn in the same classroom.

Differentiated instruction is also linked to inclusive education. Inclusive education means giving all children, no matter their background or ability, the chance to succeed. In many Sokoto classrooms, students come from different family settings, including urban and rural areas, rich and poor households, and literate and non-literate backgrounds. Without differentiated instruction of teaching, the low learners often feel left out, lose interest, and sometimes even stop school. But when teachers use flexible methods, Mathematics becomes easier for everyone, and even struggling students in number and numeration can take part in the learning.

Theoretical Lens

Experiential learning theory was chosen to serve as lens through which the problem is viewed from theoretical perspective. The theory was developed by Kolb (1984), and it explains that learning is most effective when students are actively involved in the process. Instead of only listening to teachers, learners gain deeper understanding when they participate in activities, practice skills, and connect lessons to real-life experiences. According to this theory, learning happens in a cycle where students first have an experience, then reflect on it, draw meaning from it, and finally apply what they have learned to new situations. In the context of Mathematics, this means that students learn better when teachers use practical activities, problem-solving tasks, and group discussions. Differentiated instruction supports this theory because it provides students with varied experiences that match their learning styles and needs. By engaging students actively, differentiated teaching helps them retain concepts, improve performance, and develop a more favourable attitude toward Mathematics.

Methodology

The study adopted a quasi-experimental design because it compares the performance of students taught using differentiated instruction with those taught using conventional methods. According to Oribhabor (2020) this design is chosen because it allows the researcher to measure changes in students' performance after applying different teaching approaches. The population of this study consists of all Junior Secondary School (JSS II) students in selected public secondary schools in Sokoto State Nigeria. These students were chosen because they are at a level where number

and numeration topics are taught in detail, and their performance can be easily measured. Hence, Table 1 contained the number of students enrolled in this public secondary schools located within Sokoto State Nigeria.

Table 1: Population of the Study

S/N	Education Zone	Number of Students
	Sokoto North	15,784
	Sokoto South	34,879
	Gwadabawa	7,368
	Bondiga	10,647
	Goronyo	12,501
	Yabo	12,860
Total	Six (6) Education Zones	94,039

Source: Sokoto State Ministry of Basic and Secondary Education (2025)

From the population, a multi-stage sampling technique was adopted, in which, at first stage, a sample of 384 students was deliberately selected using Morgan and Krejcie (1970) Table for sample size determination. The reason for the deliberate sampling was because some schools could not be chosen because of the insecurity-infested nature of their locations. In the second stage, stratified sampling was further adopted to select two education zones from the six education zones in the state, i.e. Sokoto North and Sokoto South. In the third stage, simple random sampling was used to select six (6) schools from the two (2) education zones, and in the fourth stage, from each school, sixty four (64) students from one intact class were considered and subsequently, using simple random sampling were assigned into experimental and control groups. Table 2 is the summary of the sample drawn from the six (6) schools selected for the study.

Table 2: Sample for the Study

S/N	Selected School	Education Zone	Selected Students	
			Male	**Female**
	GGSS Kofar Rini (Experimental)	Sokoto South	0	64
	GTC Runjin Sambo (Control)	Sokoto North	64	0
	GGSS Kofar Marke (Experimental)	Sokoto South	0	64
	SBMSS Sokoto (Control)	Sokoto North	64	0
	GMSS Sokoto (Experimental)	Sokoto South	64	0
	GGSS Tudun Wada (Control)	Sokoto South	0	64
Total	Six (6) Schools (3 Exp., 3 Cont.)	Two (2) Zones	192	192
Grand Total			**384**	

Source: Fieldwork (2025)

Results (Descriptive and Inferential Analysis)

Table 3: Distribution of Students by Gender

Group	Male	Female	Total
Experimental	96(50.0%)	96(50.0%)	192(50.0%)
Control	96(50.0%)	96(50.0%)	192(50.0%)
Total	**192(50.0%)**	**192(50.0%)**	**384(100%)**

Source: Fieldwork (2025)

Table 3 showed the gender distribution of the participants (i.e. students) in frequencies and percentages as well as the participants' distribution by subjects' categorization (i.e. experimental and control groups) in the selected schools. The analysis showed that the experimental group consisted of 192 students, made up of 96 males (50%) and 96 females (50%). Similarly, the control group also had 192 students, with 96 males (50%) and 96 females (50%). This indicates that the study had an equal number of male and female students across both groups.

Answering Research Questions

Research Question One: What is the difference in performance between students taught number and numeration using differentiated instruction and those taught using conventional teaching method?

To answer research question one, the data collected from 384 secondary school students' in Sokoto State on students' academic performance obtained from the research instrument i.e. Mathematics Achievement Test (MAT) administered in this study. The students' performance in number and numeration were sorted according to the experimental and control group and was analyzed. The results of the analysis are presented in Table 4

Table 4: Summary of Mean and Standard Deviation of Students' Performance in Mathematics between the Experimental and Control Groups

Group	N	Mean	SD	Mean difference
Experimental	192	46.82	5.15	
				14.08
Control	192	32.74	6.84	

Source: Fieldwork (2025)

Table 4 is a summary of descriptive statistics of mean and standard deviation calculated to obtain the degree of the effect of differentiated instructions on students' performance among secondary schools in Sokoto State. The data analysis revealed that there is a mean difference of 14.08 between the performance of students in the control group (N=192, Mean=46.82 and SD=5.15) and those in the experimental group (N=192, Mean =32.74 and SD =6.84). The result showed a mean difference of 14.08 between the experimental and control group. In order to ascertain whether this mean difference is significant or not, hypothesis testing was carried out and the result in on Table 6.

Research Question Two: What is the gender difference in performance between male and female students taught number and numeration using differentiated instruction?
To answer research question two, the data collected from 384 secondary school students' in Sokoto State on students' academic performance obtained from the research instrument i.e. Mathematics Achievement Test (MAT) administered in this study. The students' performance in number and numeration were sorted according to the male and female students who participated in the study, and were analyzed. The results of the analysis are presented in Table 5

Table 5: Mean Performance of Male and Female Students in the Experimental Group

Gender	N	Mean	SD	Mean Difference
Male	96	47.10	5.04	
				0.55
Female	96	46.55	5.26	

Source: Fieldwork (2025)

Table 5 is the summary of descriptive analysis of mean and standard deviation calculated to obtain the degree of the effect of differentiated instructions on students' performance among secondary schools in Sokoto State. The data analysis revealed that there is a mean difference of 0.55 between the mean performance of male (N=96, Mean=47.10 and SD=5.04) and female students (N=192, Mean =32.74 and SD =6.84). The result showed a mean difference of 0.55 between the male and female students. In order to ascertain whether this mean difference is significant or not, hypothesis testing was carried out and the result in on Table 7.

Hypotheses Testing

This section presents the analysis of the entire null hypothesis corresponding to the research questions formulated for this study which were tested at 0.05 level of significance. For clarity, the null hypothesis is taken one after the other.

Hypothesis One (H_{01})

There is no significant difference in the performance of students taught number and numeration using differentiated instruction and those taught using conventional methods. An independent t-test was used to test this hypothesis. Thus, the result is presented on Table 6.

Table 6: Summary of Independent *t*-test on the Students' Performance in Number and Numeration between Experimental and Control Groups

Subjects	N	Mean	SD	Df	*t*-Cal	*p*-value	Decision
Experimental	192	46.82	5.15				
				382	21.44	0.01	H_{01} Rejected
Control	192	32.74	6.04				

Source: Fieldwork (2025) Level of Significance = 0.05

Table 6 is the summary of independent t-test conducted to compare the difference in academic performance between students from the control group (N=192, Mean=32.74 and SD=6.04) and experimental group (N=192, Mean=46.82 and SD=5.15) of the selected secondary schools in Sokoto State. The analysis revealed that there is statistically significant difference between the mean of students taught using differentiated instructions (experimental group) and those taught using conventional method (control group). From the analysis, *t*-Cal= 21.44, *p*-value = 0.01, at $\alpha = 0.05$ and df=382. Therefore, since the *p*-value of 0.01 is significantly less than 0.05 level of significance, the null hypothesis one which states that, there is no significant difference in the performance of students taught number and numeration using

differentiated instruction and those taught using conventional methods is rejected. Thus, students in the experimental group perform significantly better in number and numeration than their counterparts in the control group among junior secondary schools in Sokoto State.

Hypothesis Two (H_{02})

There is no significant gender difference in performance of male and female students taught using differentiated instruction.

Table 7: Summary of Independent *t*-test on the Students Performance in number and numeration based on gender

Gender	N	Mean	SD	df	*t*-Cal	*p*-value	Decision
Male	92	47.10	5.04				
				182	1.12	0.01	H_{03} Rejected
Female	92	46.55	5.26				

Source: Fieldwork (2025) Level of Significance = 0.05

Table 7 is the summary of independent t-test conducted to compare the difference in academic performance between male students (N=92, Mean=47.10 and SD=5.04) and female students (N=92, Mean=46.55 and SD=5.26) of the selected secondary schools in Sokoto State. The analysis revealed that there is statistically significant difference between the mean of male and female students taught using differentiated instruction (experimental group). From the analysis, *t*-Cal= 1.12, *p*-value = 0.01, at $\alpha = 0.05$ and df=382. Therefore, since the *p*-value of 0.01 is significantly less than 0.05 level of significance, the null hypothesis two which states that, there is no significant gender difference in students' academic performance in number and numeration between male and female students taught number and numeration using differentiated instruction. Thus, male students perform significantly better in number and numeration than female student schools in Sokoto State. Therefore, gender has significant effect on achievement when differentiated instruction is used.

Findings of the Study

The following findings were obtained from the study

1. The first finding of the study showed that students taught using differentiated instruction performed significantly better than those taught using conventional methods. This means that when teachers use different teaching strategies to meet the needs and abilities of individual's student, the student understands lessons better and achieves higher scores in number and numeration.
2. The second finding of this study showed that there was no significant gender difference in the performance of male and female students in the experimental group. This result indicated that both male and female benefitted equally from differentiated instruction. This shows that gender does not affect students' performance when differentiated instruction is used.

Discussion of Findings

Empirical studies are important because they provide evidence from past researches that connect present studies. In the context of Sokoto State for instance, several studies have examined how teaching approaches influence the performance of junior secondary school students in Mathematics, especially in topics like number and numeration. For instance, Musa and Bello (2019) conducted a study in Sokoto metropolis on Mathematics teaching methods in junior secondary schools. They found that students taught with learner centered approaches like differentiated instruction performed better than those taught through lecture style teaching. The study population was J.S.S 2 students in Sokoto metropolis during (2018-2019) session. The study used 120 students as a sample from four junior secondary schools in Sokoto metropolis using simple random sampling. The students were divided into two groups, 60 in experimental group and other 60 in control group. The instrument used to collect the data was Mathematical Achievements Test (MAT). Hence, the finding of the study is in agreement with the finding of this study, that the usage of learner-centered approach to teaching in which case differentiated instruction, is better than teacher-centered teaching method, i.e. conventional teaching method

Another study was carried out in some junior secondary schools in Sokoto state to see how teaching students according to their own level can help them in mathematics. The study found that when students were given work that matched their ability, they readily understood Mathematics better and liked the subject more. The population for the study was all junior secondary school students in Sokoto State. From this group, Abdullahi (2020) chose a smaller group of students using stratified random sampling. This means the researcher made sure students from different schools and levels were included. To collect information, the researcher used a questionnaire and Mathematics tests. These helped to see both how students felt about Mathematics and how well they performed. The results showed that teaching students based on their learning needs can improve their understanding and make them do better in Mathematics.

In Kebbi State, a study in junior secondary schools showed that using different ways of teaching helped students do better in solving Mathematics problems and reduced their fear of the subject. The study was done with junior secondary students, chosen at random. The researcher used a questionnaire and a Mathematics test to collect information. A similar study in Sokoto State used 109 students, with 42 in the control group and the rest in the experimental group. The study applied a mixed method, using the Mathematics Anxiety Scale-Revised (MAS-R), a Mathematics test, and a new survey called CEP-MAR, which was tested and found reliable. The results showed that when teachers use many methods, students understand better, solve problems well, and have more confidence (Akinwale, 2021).

Conclusion

The study established that students taught using differentiated instruction performed significantly better than students taught using conventional methods. This indicates that teaching methods that consider students' individual needs, abilities, and learning styles help them understand Mathematics concepts better, leading to higher academic achievement in the subject than when other methods are used. Gender did not significantly affect students' performance in the study. Thus, both boys and girls

benefited equally from differentiated instruction. This suggests that the teaching strategy is inclusive and effective for all students, regardless of gender. This shows that using this teaching strategy not only improves performance but also increases motivation, participation, and interest in learning Mathematics. Overall, the study established that differentiated instruction is a valuable tool in secondary school Mathematics, capable of improving learning outcomes, increasing student engagement, and ensuring that all students, regardless of ability, can succeed.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Teachers should be trained in differentiated instruction. Proper training will help teachers understand how to plan and deliver lessons that meet students' different learning needs. Teachers should learn how to create activities and tasks suitable for students with varying abilities.
2. Schools should encourage the use of differentiated teaching strategies. Teachers should be supported to adopt teaching methods that consider individual learning styles, ensuring that no student is left behind.

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