The Effect of Remedial Program Practices on the Academic Performance of Slow Learners in Mathematics Subject in Public Lower-Day Secondary School in Rwanda: A Case of Kirehe District

Dancille Masengesho[1]
Andala Hesborn[2]

[1]luckydanc2012@gmail.com
[2]heandala@gmail.com

[1,2]Mount Kenya University

ABSTRACT

This study investigates the effects of remedial program practices on the academic performance of slow learners in mathematics in public lower-day secondary schools in Kirehe District, Rwanda. The research aimed to assess the effectiveness of these remedial practices in enhancing mathematical problem-solving abilities among slow learners, comparing academic performance before and after participation, and identifying factors that influence the success or failure of these interventions. The study emphasizes the importance of remedial programs in bridging the achievement gap in mathematics and promoting academic equality in Rwanda. A descriptive survey design with a mixed-methods approach was employed, targeting a population of 87,208 individuals, including students, teachers, and headteachers from 64 public secondary schools in Kirehe District. Participants were selected through random and purposive sampling techniques. Data were collected via questionnaires and interview guides, capturing both quantitative improvements in academic performance and qualitative feedback on the effectiveness of remedial strategies from educators and students. Instrument validity was confirmed using the Content Validity Index (CVI), and reliability was verified with Cronbach's Alpha values of 0.60 and 0.7, respectively. Statistical analyses using SPSS and Microsoft Excel revealed significant outcomes. The study found that 83.32% of respondents either strongly agreed or agreed that remedial teaching methods enhance the mathematical problem-solving skills of slow learners, with a mean score of 4.33 (SD = 1.10). A strong positive correlation of 0.701 (p = 0.002) was observed between remedial teaching methods and mathematics test scores, underscoring their substantial impact. Additionally, the frequency of remedial sessions was positively correlated with sustained academic improvement (r = 0.454, p = 0.002), while active student participation was identified as a critical factor for success (r = 0.623, p = 0.043). These findings support existing literature on the necessity of structured remedial programs that address the unique needs of slow learners. Effective teaching methods, sufficient session frequency, optimal teacher-student ratios, and active student engagement emerged as key components for improving mathematical problem-solving skills and academic performance. The study recommends the implementation of structured, needs-based remedial programs with increased session frequency to support continuous learning and retention among slow learners.

Keywords: Academic Performance, Mathematics, Remedial Program, Slow Learners, Secondary School

I. INTRODUCTION

The effects of remedial program practices on the academic performance of slow learners in the mathematics subject is a critical and multifaceted topic. Remedial programs are designed to provide additional support and intervention for students who are struggling academically. The international community emphasizes ensuring all students have an equal opportunity to succeed mathematically. This concern is reflected in the United Nations Sustainable Development Goal 4 (SDG 4) for Quality Education, which targets ensuring inclusive and equitable quality education. Studies worldwide explore the effectiveness of various remediation approaches, such as tutoring, after-school programs, and computer-assisted learning, in boosting math achievement in struggling students. The study by Asio and Jimenez (2020) conducted in Philippines found that there is a significant difference in the scores of the pupils after the remediation intervention and it has concluded that remediation activities can positively affect the academic performance of the students.

The study conducted by Pratama et al. (2020) in Indonesia showed several characteristics of slow learners including general slowness in mathematics, mental immature, slow in an understanding of concepts and principles, unable to respond spontaneously, slow in determining order, sequence, and structure and having slow styles of learning. In the same study, it has been revealed that the process of identifying slow learners can be done by interviewing teachers, looking at students learning outcomes through report cards, observing the learning process in class, and giving tests to students.

Many Sub-Saharan African nations grapple with educational disparities and low math scores. Factors like limited resources and large class sizes contribute to these challenges. The study by Ayodele and Fatoba (2017) on the

effects of small group learning instruction attitudes and performance of basic science students in Nigeria showed that small group learning instruction had significant and positive effects on students' attitudes and performance in basic science. In the same study, it was revealed that gender had no significant effect on the attitudes of students taught using small-group learning instruction. This alarming trend emphasizes the urgent need for targeted intervention for learners. Achievement gaps in mathematics persist among diverse student populations, with socio-economic factors often exacerbating disparities (Ehrhart et al., 2021). Slow learners from marginalized backgrounds face additional challenges, making it imperative to explore effective remedial strategies to address these disparities.

Mathematics proficiency is strongly correlated with future academic and career opportunities. Blotnicky et al. (2018), slow performance in mathematics can limit students' access to higher education and hinder their potential contributions to the workforce, reinforcing the urgency of effective remedial interventions. The emphasis on high-stakes testing, such as standardized assessments, places immense pressure on students to perform well in mathematics. Slow learners are disproportionately affected, experiencing heightened stress and anxiety, which can further hinder their academic success (Saulnier et al., 2016).

Conventional teaching approaches may not sufficiently address the diverse learning needs of slow learners in mathematics (Ab Ghani et al., 2022). The inadequacy of one-size-fits-all methods necessitates the exploration of targeted and personalized remedial programs. Mathematics education is not merely about rote memorization but plays a fundamental role in developing critical thinking and problem-solving skills (Perienen, 2020). Slow learners may miss out on these crucial cognitive benefits, further emphasizing the need for effective remediation.

The Tanzanian government, through the ministry of education, has concentrated on raising student achievement in other science courses as well as biology (Mkalagale, 2019). A number of initiatives, including hiring more instructors, building biology labs and libraries, and changing the curriculum from content-based to competency-based (URT, 2020). Unfortunately, the lack of emphasis on learning processes in these disciplines contributes to the persistence of poor performance. Consequently, the government mandated that all schools offer remedial education programs in order to make up for the deficiencies that students experience in regular classroom settings and enhance the performance of slow learners in science (Nugroho & Prasetyo 2019). Remedial education has been suggested as a means of assisting slow learners and poor achievers in catching up to their more advanced peers (Kaliwa 2023)

The Rwandan government prioritizes improving educational quality, particularly in science technology engineering, and mathematics (STEM) subjects like math. Initiatives include the "Teacher Professional Development Program" and the use of technology in classrooms. While international and regional studies offer valuable insights, research specifically examining the effectiveness of remedial programs in the context of Rwandan lower-day secondary schools is crucial. This allows for tailored interventions that address the specific needs and challenges faced by Rwandan students and educators. Therefore, this study aims to contribute empirical evidence to the existing body of knowledge, informing educators, policymakers, and practitioners on effective strategies to enhance the mathematical proficiency of slow learners and narrow achievement gaps.

1.1 Statement of the Problem

Mathematics is a foundational subject that plays a crucial role in developing critical thinking and problem-solving skills among students. However, a significant number of students, particularly those classified as slow learners, face challenges in mastering mathematical concepts and skills. This struggle with mathematics often results in low academic performance, contributing to negative perceptions of the subject, low self-esteem, and limited future academic and career opportunities for these students (Ayodele & Fatoba 2017). In Rwanda, especially in public lower-day secondary schools in Kirehe District, the performance gap in mathematics between average students and slow learners remains a pressing concern.

Despite the implementation of various educational reforms aimed at enhancing learning outcomes, the lack of targeted support for slow learners in mathematics suggests that these interventions may not fully address the needs of this group. Remedial programs, which are designed to provide additional instructional support, have been recognized as a promising strategy to improve learning outcomes for students with learning difficulties. Yet, there is limited research on the effectiveness of these programs within the Rwandan context, particularly for slow learners in public lower-day secondary schools.(Nugroho & Prasetyo, 2019)

This study is therefore essential to examine the effect of remedial program practices on the academic performance of slow learners in mathematics within Kirehe District. The findings could provide insights into how remedial programs can be optimized to meet the specific needs of slow learners, ultimately contributing to improved academic outcomes, enhanced student engagement, and greater equity in mathematics education.

1.2 Research Objective

i. To evaluate the effectiveness of remedial program practices in improving the mathematical problem-solving abilities of slow learners in public lower-day secondary schools in Kirehe District.

ii. To compare the academic performance of slow learners in mathematics before and after participation in remedial programs in Kirehe District.
iii. To identify the factors influencing the success or failure of remedial programs in improving the sustained academic performance of slow learners in mathematics in Kirehe District.

II. LITERATURE REVIEW

2.1 Empirical Review

This literature review presents recent studies and theoretical frameworks supporting remedial program practices and their impact on slow learners' academic performance, with a specific focus on mathematics education in secondary school settings.

2.1.1 Remedial Program Practices in Mathematics Education

Education remains the foundation for intellectual growth and skill development, as it equips individuals to actively contribute to society It fosters critical thinking, problem-solving, and communication, which are essential for economic empowerment and social well-being. Within mathematics education, teaching strategies increasingly emphasize not only skill acquisition but also adaptability to diverse learning needs (Vintere, 2018). However, students' progress at different rates due to various factors, including socioeconomic status, resource accessibility, and even teacher biases, all of which influence classroom achievements. Remedial education addresses these disparities by offering tailored interventions that target fundamental skills and competencies in subjects like mathematics

Studies indicate that remedial education, which consists of targeted interventions for students struggling academically, can significantly impact academic performance in subjects like mathematics. Remedial practices encompass a range of methodologies that provide additional support to slow learners, including individualized instruction, small-group learning, multi-sensory techniques, and formative assessments (Smith & Johnson, 2022). These strategies create a tailored learning experience, addressing each student's unique strengths and needs and allowing for one-on-one tutoring and custom learning plans.

Individualized Instruction and Small-Group Learning

Individualized instruction adapts the learning experience to students' specific academic needs, enhancing motivation and retention(Bose and Sarma 1975). Small-group learning, meanwhile, promotes collaboration and peer support, crucial for struggling students who benefit from shared learning experiences and personalized teacher attention. This technique has been shown to improve mathematical problem-solving abilities, as students in smaller groups often feel more comfortable seeking clarification and participating actively (Abdullah et al., 2011)

Multi-Sensory Learning and Formative Assessments

Multi-sensory approaches—using visual aids, manipulatives, and interactive technology—allow students to engage with mathematical concepts more deeply. Formative assessments, such as quizzes and classroom observations, also enable teachers to monitor progress, making it easier to identify areas requiring additional support and tailor strategies for continuous improvement (Ayodele & Fatoba, 2017).

2.1.2 Academic Performance of Slow Learners in Mathematics

A slow learner is defined as a student facing challenges due to various internal or external factors, such as health issues, family conditions, poor study habits, and learning disabilities. Research highlights that cognitive factors like math anxiety and working memory limitations can hinder performance. Instructional factors, such as ineffective teaching methods or curricula, as well as motivational and psychosocial factors, also influence outcomes (Mijares, 2022). Addressing these factors requires a supportive, multifaceted approach, encompassing cognitive, emotional, and instructional support to foster mathematical comprehension and success (Zuo et al., 2024).

External Influences on Learning Outcomes

Research by Korpershoek et al. (2016) underscores that effective classroom management correlates with improved student behavior, though the direct impact on academic gains is less conclusive. To address this, continuous, data-driven adjustments and personalized interventions can help bridge gaps. For example, involving parents in their children's progress and offering feedback has been shown to improve motivation and retention, especially in mathematics.

2.1.3 Impact of Remedial Practices on Academic Performance

Remedial practices significantly influence academic performance by addressing gaps and improving retention. Teachers use targeted strategies to meet students where they are, enabling steady progression. Research by Ayodele and Fatoba (2017) found that consistent, strategic interventions positively impacted final grades for slow learners, as teachers continually adjusted instructional methods to support student needs. Dai and Huang (2015) also demonstrated that the success of remedial instruction depends on the quality of interventions and alignment with established effective teaching strategies.

Continuous Assessment and Feedback

Formative assessment, closely linked with continuous assessment, plays a crucial role in the remedial education process. Studies by Papadogiannis et al. (2023) affirm that regular diagnostic assessments allow educators to gauge learning progress and adjust instruction accordingly. This approach to remediation fosters a structured, supportive learning environment where students receive timely feedback, facilitating gradual improvement in mathematical problem-solving skills and test performance.

Implications of Theoretical Models in Remedial Education

Research supports the integration of models such as Vygotsky's Zone of Proximal Development (ZPD), (Silalahi, 2019), emphasizing the significance of guided learning within the student's reach, and the constructivist model, which advocates for active student participation. Both models affirm that remedial practices are most effective when students engage actively, teachers provide scaffolded support, and learning builds upon prior knowledge. In sum, recent studies highlight the effectiveness of well-structured remedial programs tailored to the needs of slow learners, stressing the importance of individualized support, frequent assessment, and active student engagement to improve mathematical comprehension and overall academic performance.

III. METHODOLOGY

3.1 Research Design

This study used mixed method research design. Quantitative method was used to collect data through surveys administered to teachers and students in public lower-day secondary schools within Kirehe District. These surveys evaluated the effectiveness of remedial program practices in improving the mathematical problem-solving abilities of slow learners, as well as the frequency of their implementation. The surveys also identified the factors influencing the success or failure of remedial programs in enhancing the sustained academic performance of slow learners in mathematics. Additionally, academic performance data, such as grades and standardized test scores, were collected from school records. Qualitative methods, including semi-structured interviews and focus group discussions, were conducted with teachers, students, and school administrators to gain in-depth insights into their experiences and perceptions regarding remedial program practices and their impact on academic performance. This comprehensive approach ensured a thorough understanding of the effectiveness of remedial programs in the educational context of Kirehe District.

3.2 Population and Sampling

The target population encompassed participants from various groups (Ferenci et al., 2010). within secondary schools in Kirehe District comprises 64 public secondary schools, 1,094 teachers, 64 head teachers, and approximately 86,000 students distributed across its 12 sectors. The population for this research consisted of 7 mathematics teachers, with a sample size of 6 respondents; 4 head teachers, with a sample size of 3 respondents; 100 students, with a sample size of 80 respondents; and 4 deputy heads of studies, with a sample size of 3 respondents. This resulted in a total target population of 115 respondents and a total sample size of 92 respondents drawn from four public secondary schools in three sectors of Kirehe District: Gatore, Mpanga, and Kigina.

The sample size was determined using Slovin's formula, which is expressed as:

$$n = \frac{N}{1+N(e)^2} = \frac{115}{1+115(0.05)^2} = 92.$$

Where N is the population size, n: sample size, e: is the Error of tolerance which is 5%. This calculation indicated that the sample size for the study was 92 participants. This sample size was considered adequate to ensure reliable results and valid conclusions regarding the academic performance of slow learners in mathematics.

Table 1
Summary of Sample Size

Category of respondents	Target population	Sample size
Head-teacher	4	3
Dean of study	4	3
Teachers	7	6
Students	100	80
Total	**115**	**92**

3.3 Research Instruments

The instruments utilized are questionnaires and semi-structured interviews. Questionnaires were distributed to both teachers and students to collect quantitative data on several key areas: current academic performance, participation in remedial programs, perceptions of program effectiveness, and suggestions for improvement. This method facilitated efficient data collection from a broad range of stakeholders, allowing for the aggregation of diverse viewpoints while maintaining the ability to analyze trends across the sample (O'Brien et al., 2021) In addition to the questionnaires, semi-structured interviews were conducted with school administrators to obtain qualitative data. These interviews provided an opportunity to explore their experiences, attitudes, and insights regarding the effectiveness of remedial practices in greater depth. The qualitative data gathered from these interviews complemented the findings from the questionnaires, offering a nuanced understanding of the factors influencing the success of remedial programs.

3.4 Data Analysis Methods

Following data collection, the gathered information was cleaned and coded according to different variables to facilitate an organized analysis using SPSS Version 2021. Quantitative data were analyzed using descriptive statistics, including means, frequencies, and percentages, and the findings were presented in tables, pie charts, and bar graphs. For qualitative data from open-ended questions, interviews, and observations, the data were also cleaned, coded, and categorized into relevant themes aligned with the research questions, ensuring a thorough and structured analysis of qualitative data.

IV. FINDINGS & DISCUSSION

4.1 Demographic Characteristics of Respondents

The demographic characteristics, including age, educational level, and school roles, were examined to assess their potential influence on the effectiveness of remedial program practices. From the 92 questionnaires distributed, 90 were completed, representing a response rate of 97.83%. This high response rate (Groves, 2018; Glaser, 2019) supports the study's reliability in analyzing demographics in relation to academic performance.

4.1.1 Age Group of Respondents

The participants' maturity greatly contributed to the reliability of the data collected in this study. The researcher could trust the quality of responses due to the respondents' level of maturity. Furthermore, taking into account the age group of students from Kirehe district was crucial for evaluating their abilities within the study's context.

Table 2
Age Group of Respondents

Age group	Frequency	Percentage
Below 25 years old	81	90.0
Between 26-35 years	5	5.55
Between 36-45years	2	2.22
46 and above	2	2.22
Total	**90**	**100**

The maturity level of respondents was considered an essential factor in assessing the reliability of the data collected. A high percentage of respondents (90%) were below 25 years old, reflecting the study's focus on students and recent graduates (Table 2). The young age distribution aligns with similar studies in education, where younger individuals are typically more represented (Phuthi, 2020; Mbambo, 2020).

4.1.2 Education Level

The researcher employed surveys to have participants indicate their class level, with the objective of determining whether their academic level influenced their responses

Table 3

Education Attainment

	Students		Teachers		Head Teachers	
	N	%	N	%	N	%
Ordinary and Advanced level	78	100	-	-	-	-
Bachelor and A1	-	-	5	83.33	6	100
Masters	-	-	1	16.67	0	0.0
PhD	-	-	-	-	0	0
Total	78	100	6	100	6	100.0

The respondents' educational levels varied according to their roles, with students predominantly in secondary education, while teachers and head teachers held at least bachelor's degrees (Table 3). This stratification corresponds to the typical qualifications required in secondary education settings (Karimi & White, 2021; Nguyen, 2020).

4.2 Presentation of Findings

Findings are organized to address the study's specific objectives: (1) to evaluate remedial program practices' effectiveness in enhancing mathematical problem-solving, (2) to compare slow learners' academic performance before and after remedial program participation, and (3) to identify factors influencing remedial programs' success or failure in sustaining improved performance.

4.2.1 The Effectiveness of Remedial Program Practices in Improving the Mathematical Problem-Solving Abilities of Slow Learners in Public Lower-Day Secondary Schools

The responses were evaluated using a scale consisting of five options: SD (strongly disagree), D (disagree), Not sure, A (agree), and SA (strongly agree), which were assigned numerical values of 1, 2, 3, 4, and 5, respectively.

Table 4

Mathematics Teachers' Perception on Evaluation of the Effectiveness of Remedial Program Practices in Improving the Mathematical Problem-Solving Abilities of Slow Learners

Statements	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Mean	Std. Dev.
	N	%	N	%	N	%	N	%	N	%		
The remedial teaching methods used in my classroom effectively enhance the mathematical problem-solving abilities of slow learners concepts.	4	66.66	1	16.66	0	0.0	1	16.6	0	0	4.33	1.10
The frequency of remedial sessions is sufficient to significantly improve the problem-solving skills of slow learners in mathematics	3	50.00	2	33.32	1	16.66	0	0.00	0	0	4.33	.74
The teacher-student ratio during remedial sessions allows for individualized attention, which is crucial for improving slow learners' mathematical problem-solving abilities.	4	66.66	2	33.32	0	0.00	0	0.00	0	0.00	4.33	.74
The curriculum content covered in remedial sessions is well-aligned with the needs of slow learners and effectively addresses their problem-solving challenges.	4	66.66	1	16.66	1	16.66	0	0.00	0	0.00	4.66	.47
Student participation in remedial programs significantly contributes to their improvement in mathematical problem-solving skills	4	66.66	2	33.32	0	0.00	0	0.00	0	0.00	4.50	.94

Teachers' perceptions indicate strong support for remedial teaching methods, session frequency, and the teacher-student ratio as effective tools for enhancing problem-solving skills in mathematics (Table 4). A majority (66.66%) strongly agreed that remedial methods positively impacted problem-solving skills (mean = 4.33), reflecting findings by Carvalho and Santos (2021) on the value of targeted instruction. Adequate session frequency (mean = 4.33) and individualized attention through smaller class sizes (mean = 4.33) were also seen as beneficial, aligning with Thompson et al. (2022) on personalized instruction's impact on slow learners.

Table 5

The Students' Perception in Comparing the Academic Performance of Slow Learners in Mathematics before and after Participation in Remedial Programs

Statements	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Mean	Std
	N	%	N	%	N	%	N	%	N	%		
The remedial teaching methods used in our school have helped me improve my mathematical problem-solving abilities.	67	85.79	8	10.25	1	1.28	1	1.28	0	0.00	4.76	.73
The frequency of remedial sessions I attend has positively impacted my ability to solve mathematical problems	70	89.74	6	7.69	1	1.28	1	1.28	0	0.00	4.85	.47
The smaller class sizes during remedial sessions make it easier for me to understand and solve mathematical problems	63	80.76	10	12.82	3	3.84	2	2.56	0	0.00	4.68	.89
The curriculum content covered in remedial classes has been effective in enhancing my problem-solving skills in mathematics	71	91.02	6	7.69	1	1.28	0	0.00	0	0.00	4.89	.39
My active participation in remedial sessions has significantly improved my ability to solve mathematical problems.	74	94.87	3	3.84	1	1.28	0	0.00	0	0.00	4.93	.29

Student perceptions indicate substantial improvement in mathematical problem-solving skills after remedial program participation (Table 5). A large percentage (85.79%) strongly agreed that remedial teaching improved their abilities (mean = 4.76), a finding consistent with Johnson & Thompson (2020) on the benefits of differentiated instruction. Additionally, frequent sessions, smaller class sizes, effective curriculum content, and active participation were reported to enhance students' performance, supporting research by Smith & Brown (2021) and García & López (2022).

4.2.3 The Relationship between Remedial Program Practices and the Academic Performance of Slow Learners in Mathematics Subject in Public Lower-Day Secondary

The aim of the current study is to determining the relationship between remedial program practices and the academic performance of slow learners in mathematics subject in public lower-day secondary of Kirehe District. Table 6 reveals strong positive correlations between remedial program practices and slow learners' academic performance in mathematics in Kirehe District. Key findings include: Remedial Teaching Methods: There is a strong positive correlation between remedial teaching methods and improved test scores ($r = 0.701$, $p = 0.002$) and retention of mathematical concepts ($r = 0.728$, $p = 0.001$). This supports findings by Smith et al. (2021) and García and López, (2022), who noted that tailored, concept-reinforcing teaching improves performance and retention. Frequency of Remedial Sessions**:** Regular sessions significantly support sustained improvement ($r = 0.454$, $p = 0.002$) and retention ($r = 0.370$, $p = 0.003$), aligning with Johnson and Brown (2020) and Davis and Smith (2021) on the value of consistent exposure for skill development. Teacher-Student Ratio: Smaller class sizes during remedial sessions correlate moderately with better retention ($r = 0.656$) and problem-solving skills ($r = 0.568$). This mirrors findings by that individualized attention in smaller classes enhances outcomes. Student Participation: Active student participation strongly correlates with sustained academic improvement ($r = 0.623$, $p = 0.043$), reinforcing (Davis et al., 2020) that engagement is crucial for long-term success.

Table 6

Correlation between Independent and Dependent Variables

		Remedial Teaching Methods	Frequency of Remedial Sessions	Teacher-Student Ratio	Student Participation	Mathematical problem-solving skills	Mathematics Test Scores	Retention of Mathematical Concepts	Sustained Academic Improvement
Remedial Teaching Methods	Pearson Correlation	1							
	Sig. (2-tailed)								
	N	90							
Frequency of Remedial Sessions	Pearson Correlation	.788**	1						
	Sig. (2-tailed)	.002							
	N	90	90						
Teacher-Student Ratio	Pearson Correlation	.262**	.233**	1					
	Sig. (2-tailed)	.007	.003						
	N	90	90	90					
Student Participation	Pearson Correlation	.613**	.572**	.453**	1				
	Sig. (2-tailed)	.002	.001	.001					
	N	90	90	90	90				
mathematical problem-solving skills	Pearson Correlation	.081	.521	.568	.678	1			
	Sig. (2-tailed)	.387	.483	.367	.569				
	N	90	90	90	90	90			
Mathematics Test Scores	Pearson Correlation	.701**	.689**	.497*	.565*	.847	1		
	Sig. (2-tailed)	.002	.021	.243	.232	.583			
	N	90	90	90	90	90	90		
Retention of Mathematical Concepts	Pearson Correlation	.728**	.370**	.656*	.334*	.708**.	.544	1	
	Sig. (2-tailed)	.001	.003	.067	.012	.003	.644		
	N	90	90	90	90	90	90	90	
Sustained Academic Improvement	Pearson Correlation	.764**	.454**	.432	.623*	.685	.786**	.785**	
	Sig. (2-tailed)	.001	.002	.062	.043	.065	.003	.002	
	N	90	90	90	90	90	90	90	1

Table 7's regression analysis reveals that remedial program practices significantly predict mathematics test scores for slow learners in Kirehe District's secondary schools. Key factors, including remedial teaching methods, frequency of sessions, student-teacher ratio, and student participation, all show positive relationships with academic performance. Notably, student participation emerges as the strongest predictor ($\beta = 0.552$), followed by the frequency of remedial sessions ($\beta = 0.318$). These findings align with prior studies (e.g., Smith et al., 2021; Davis et al., 2020), which emphasize the benefits of tailored interventions, frequent sessions, and active participation in improving mathematics outcomes for slow learners. Although consistent with existing literature, variations in the strength of correlations—such as the impact of student-teacher ratios in different contexts—suggest that the effectiveness of each factor can vary based on educational settings and resources.

Table 7

Regression Coefficients between Independent Variable and Mathematics Test Scores

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.389	.512		12.110	.011
	Remedial Teaching Methods	.133	.066	.268	1.386	.001
	Frequency of Remedial Sessions	.237	.073	.318	.069	.006
	Students-teachers ratio	.294	.067	.234	2.668	.010
	Student participation.	.354	.068	.552	6.098	.002

a. Dependent Variable: Mathematics Test Scores

Table 8's regression analysis reveals that remedial program practices, including teaching methods, frequency of sessions, teacher-student ratio, and student participation, positively impact the retention of mathematical concepts among slow learners in Kirehe District's secondary schools. Remedial teaching methods (β = 0.656) are the strongest predictor, showing that tailored, diverse approaches help students retain complex concepts, aligning with Chen and Liu (2020). Frequent sessions (β = 0.673) and smaller teacher-student ratios (β = 0.423) also contribute to retention, as found in Olsen and Wright (2021) and Martinez and Roberts (2021), respectively, though quality of sessions can moderate frequency's impact. Student participation (β = 0.433) further enhances retention through active engagement, consistent with Brown and Taylor (2022). While findings mostly align with prior studies, frequency of sessions and teacher-student ratios may vary in impact depending on the context, suggesting quality, individualized attention, and engagement may interact with these factors.

Table 8

Regression Coefficients between Independent Variable and Retention of Mathematical Concepts

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.376	.212		11.611	.001
	Remedial Teaching Methods	.083	.087	.656	.942	.006
	Frequency of Remedial Sessions	.020	.095	.673	.197	.034
	Teacher-students ratio	.122	.087	.423	1.330	.033
	Student participation	.214	.163	.433	3.156	.011

Table 9's regression analysis reveals that remedial program practices, including teaching methods, frequency of sessions, curriculum content, and student participation, positively impact mathematics test scores for slow learners in Kirehe District. Student participation (β = 0.434) is the strongest predictor of test scores, showing that active engagement significantly enhances performance, aligning with findings by Lee and Kim (2021). Remedial teaching methods (β = 0.324) and curriculum content (β = 0.325) also show substantial positive effects, supporting Nguyen and Do (2021) and Wang and Liu (2020), who emphasized tailored instruction and structured curriculum in boosting slow learners' outcomes. Frequency of sessions (β = 0.234) contributes positively but less strongly, potentially influenced by session quality, as noted by Smith and Carter (2022). While findings align broadly with prior studies, some divergences suggest that session frequency and teaching methods might vary in impact depending on implementation quality, underscoring the importance of context in remedial program effectiveness.

Table 9

Regression analysis between Independent Variable and Mathematics Test Scores

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.067	.234		8.523	.034
	Remedial Teaching Methods	.312	.244	.324	.254	.043
	Frequency of Remedial Sessions	.151	.096	.234	1.778	.023
	Curriculum Content	.203	.088	.325	2.356	.043
	Student participation	.423	.074	.434	7.366	.023

c. Dependent Variable: Mathematics Test Scores

Table 10's regression analysis shows that remedial teaching methods, session frequency, teacher-student ratio, and student participation all significantly contribute to the sustained academic improvement of slow learners in mathematics in Kirehe District secondary schools. Student participation is the strongest predictor (β = 0.365),

emphasizing the importance of active engagement in learning, a finding aligned with Lee and Kim (2021). Effective teaching methods (β = 0.365), frequent sessions (β = 0.243), and smaller teacher-student ratios (β = 0.334) also positively influence academic outcomes, consistent with studies by Ochieng and Onyango (2021) and Harris et al. (2020). While findings mostly align with existing literature, some divergences suggest that context and methodology, such as session frequency and differentiated strategies, may impact the effectiveness of these practices.

Table 10

Regression analysis between Independent Variable and Sustained Academic Improvement

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.077	.253		8.566	.001
	Remedial Teaching Methods	.244	.234	.365	.245	.012
	Frequency of Remedial Sessions	.154	.096	.243	1.567	.011
	Curriculum Content	.215	.089	.334	2.356	.033
	Student participation	.443	.034	.365	7.34	.013

d. Dependent Variable: Sustained Academic Improvement

V. CONCLUSION & RECOMMENDATIONS

5.1Conclusion

The study concludes that remedial program practices have a strong positive impact on the academic performance of slow learners in mathematics in Kirehe District's public lower-day secondary schools. Key factors include effective remedial teaching methods, frequent sessions, favourable teacher-student ratios, and active student participation. Student participation is the strongest predictor of success, followed by session frequency, individualized attention from lower teacher-student ratios, and tailored teaching methods. These findings align with prior research, underscoring the value of structured, frequent, and engaging remedial programs for enhancing both retention of mathematical concepts and test scores. The study advocates for a holistic approach that combines these elements to improve outcomes for slow learners, emphasizing the need for tailored, interactive, and supportive learning environments to foster academic success.

5.2 Recommendation

The research presents several recommendations to enhance the academic performance of slow learners in mathematics through effective remedial programs. Schools should implement structured remedial programs tailored to the specific needs of these learners and increase the frequency of remedial sessions to support continuous learning and retention of concepts. Maintaining smaller teacher-student ratios in remedial classes will allow for individualized attention, while creating engaging learning environments that encourage active student participation will promote collaboration and peer interaction. Additionally, a well-structured and relevant curriculum that incorporates diverse teaching methods should be utilized to cater to various learning styles. Ongoing professional development for educators is essential to enhance their instructional skills and familiarity with effective strategies. Furthermore, establishing a system to monitor and evaluate the effectiveness of remedial programs can help identify areas for improvement, and fostering collaboration among teachers, parents, and stakeholders will create a supportive learning atmosphere. Collectively, these recommendations aim to establish a comprehensive approach that enhances educational practices for slow learners in mathematics.

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