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Exploring the Causes of Disparity in Mathematics Performance between Rural and Urban Secondary School Students in Kigali City, Rwanda

Munana Reuben[1] and Vedaste Mutarutinya[2]
[1]African Centre of Excellence for Innovative Teaching and Learning Mathematics and Science (ACEITLMS), College of Education, University of Rwanda; [2] School of Education, College of Education, University of Rwanda
Email: munanareuben74@gmail.com

Abstract: *Persistent disparities in mathematics performance between rural and urban secondary school students remain a significant challenge to achieving equitable education in Rwanda. This study examined the factors contributing to these disparities in Kigali City, focusing on socioeconomic status and family background, access to educational resources, and community-family engagement. The study was conducted using the mixed methods research design under the pragmatism paradigm. The total number of Senior Five pupils from rural and urban public secondary schools was 223, sampled using stratified random sampling. Data was collected using structured questionnaires and analyzed using descriptive statistics and multiple linear regression analysis using Stata MP 16.1 software. The mean score obtained by urban students was 73.04%, while for rural pupils, it was 64.93%. Multiple linear regression analysis identified socioeconomic status and family background as the strongest predictor of mathematics achievement ($\beta = 1.28$, $p < 0.001$), followed by access to educational resources ($\beta = 0.91$, $p < 0.001$). These findings emphasize the significance of family socio-economic situation and provision of educational resources in accounting for the differential performance of the students in mathematics. The research concludes that any effort to reduce disparities between rural and urban areas must be made through the implementation of special programs to foster equality in education. The Ministry of Education together with other stakeholders should facilitate equal access to educational resources.*

Keywords: *Mathematics Achievement, Rural schools, Urban schools, Educational resources, Socioeconomic status, Rwanda*

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1. Introduction

Mathematics is significant in enhancing the logic and skills required for science and technological growth through problem-solving (Sindhu et al., 2017). In Rwanda, Mathematics is a compulsory subject taught in the Competence-Based Curriculum (CBC), focusing on critical thinking, creative thinking, teamwork, and problem-solving. Despite the efforts that have been made towards educational reforms and teacher training, the gap in the performance of mathematics by rural and urban secondary schools still exists.

Urban schools have greater access to trained educators, learning materials, libraries, laboratories, and ICTs than do rural schools, which face challenges in having limited resources and poor learning environments that can affect their learning possibilities (Ochoche & Oguche, 2022; Zhao & Akiba, 2009). Rwanda's population census as well as its reports on the national education have revealed disparities in educational attainment between the two locations (NISR, 2022; REB, 2020).

It has been shown that math achievement has been related to socioeconomic status, parental education, teacher efficacy, educational opportunities, and family involvement (Agbenyega, 2013; Mullis et al., 2011; Wang et al., 2023). There is scant empirical information on the association between socioeconomic status and family background, educational opportunities, and community and family involvement in explaining performance differences in mathematics between rural and urban high schools in Kigali City.

Therefore, this study investigates the factors contributing to these disparities by examining socioeconomic status and family background, educational resources, and community and family involvement.

Research Objectives

The study aims to achieve the following specific objectives:

1. To examine the influence of socio-economic status and family background on mathematics performance
2. To assess the effect of educational resources on students' mathematics achievement
3. To evaluate the role of community and family involvement in students' mathematics performance

2. Literature Review

This section provides literature review on previous empirical and theoretical studies related to mathematics performance among students. It is divided into two parts: the empirical review, where past empirical evidence will be analyzed, and the theoretical review, where the theories behind the study will be discussed. The review highlights socioeconomic status and family background, educational factors, and community and family participation with respect to mathematics performance and urban-rural educational disparities in Kigali City.

2.1 Empirical Review

Social status and family background are well known to be some of the most critical factors which contribute to the success of students. Social status is usually understood as the social standing of a family from the socioeconomic point of view. It is usually determined based on several criteria such as parents' education, occupation, income, and resources for education. Such factors can affect students' performance in mathematics. Sirin (2005), in a meta-analysis of 74 independent samples involving 101,157 students, found a moderate to strong relationship between socioeconomic status and academic achievement. Similarly, the Organization for Economic Co-operation and Development (OECD, 2019), using data from the Program for International Student Assessment (PISA) 2018, reported that socioeconomic status was significantly associated with mathematics performance. Disadvantaged students usually faced higher levels of educational challenges compared to their counterparts who were more privileged. From the above findings, it is evident that parents' education level, resources available in the family, and the home environment are some of the aspects that may play a role in the disparities in mathematics performance. The magnitude of the effects of such factors needs to be determined locally.

Educational resources are another vital aspect that is significant in terms of contributing to Mathematics performance. Educational resources include textbooks, capable teachers, instructional materials, libraries, appropriate classrooms, and information communication technology. Availability of the above-mentioned resources can assist in the performance of mathematics via practice, visualization, problem solving and conceptualization. Mullis et al. (2012) in "TIMSS 2011 International Results in Mathematics" investigated mathematics performance along with other information related to the environment at home, teachers, classroom and schools of the students. They pointed out the importance of examining the educational context of Mathematics learning. Moreover, OECD (2023) in the PISA 2022 report mentioned considerable differences in mathematics performance among the socio-economically advantaged and disadvantaged students. Although these differences cannot be attributed to the presence of the educational resources only, it indicates the importance of the examination of inequality in learning opportunities. In both rural and urban schools, there could be inequality in the access to books, competent teachers, classroom conditions as well as ICT. However, neither rural nor urban location of the school implies having appropriate educational resources. That is why the present research centers around the issue of availability of educational resources and their impact on Mathematics achievement.

Community and family involvement also plays an important role in students' educational experiences. It refers to the participation of parents, guardians, and community members in supporting learning through academic encouragement, monitoring school attendance, communicating with teachers, and participating in school activities. Hill & Tyson (2009), through the meta-analysis of 50 researches that studied the effect of parental involvement on academic achievements during middle school, noted that the majority of the time, parental involvement had positive effects on academic achievements. Academic socialization, which included discussion of educational expectations and the significance of education itself, had the most positive effect on academic achievements. Nevertheless, direct assistance from the parents with homework did not always yield positive results. Similarly, Epstein (2011) stressed that collaboration between families, schools, and community members could help in educating the students. Collaboration could help improve communication, foster positive attitude toward learning, and increase sense of responsibility for the students' achievements. At the same time, parents' involvement in the education process could be hindered by work schedule and education level, among other factors. These findings suggest the need to examine how community and family involvement relates to mathematics performance among students attending rural and urban secondary schools in Kigali City.

As for the empirical research, its literature review clearly demonstrates that socio-economic status, educational inputs and community and family participation are important variables concerning the issue of student academic performance. Moreover, the above-mentioned variables can have interaction in terms of family income, which affects access to learning resources, parents' education and communication of families and schools, which influence the amount of academic support, received by children. However, the data gathered on the international level cannot be used immediately regarding the problem of Kigali City. Therefore, it is required to conduct research in order to establish the correlation between socio-economic status and family background, educational inputs and community and family participation and math performance of students in urban and rural secondary schools.

2.2 Theoretical Review

Bronfenbrenner's Ecological Systems Theory provides one of the theoretical foundations for this study. Bronfenbrenner (1979) explained that human development is shaped by interactions between individuals and their surrounding environments. The theory explains environmental systems which are related to each other and they include microsystem, mesosystem, ecosystem, and macro-system. Microsystem involves close environments such as the family and school which involve direct interactions of students with their parents, teachers, and peers. Other factors such as economic environment, institutions, and values could also affect the education of students. This theory is important since mathematics achievement could be related to the socio-economic status of the family, conditions at the school, and support by parents and communities to the students. For instance, income of the family would determine whether textbooks are available, and interaction between the parents and teachers could assist in knowing the challenges of students in learning mathematics.

Epstein's Theory of Overlapping Spheres of Influence provides a second theoretical foundation for the study. Epstein (2011) argues that families, schools, and communities share responsibility for supporting students' educational development. These institutions can work together using the methods of communication, parental involvement, learning at home, and community involvement. This theoretical view is applicable because the process of studying mathematics does not happen only in the classroom. Parents can motivate children to do mathematics, teachers can inform parents about problems with learning, and community agencies can help in education. When these types of involvement are coordinated, students can get more motivation and support in their studies. In the current research, the theory of Epstein will be used for analyzing the role of community and family in mathematics achievement. Together, Bronfenbrenner's Ecological Systems Theory and Epstein's Theory of Overlapping Spheres of Influence provide complementary perspectives for understanding the relationships between students' family backgrounds, school resources, community support, and mathematics achievement in rural and urban secondary schools in Kigali City.

3. Methodology

3.1 Research Design and Study Area

In this study, the research paradigm used was that of pragmatism and the research design applied was that of convergent mixed-methods research approach in exploring factors leading to differences in mathematics performance among secondary school students in urban and rural areas of Kigali City. Pragmatism research paradigm was deemed suitable for use since it is a framework in which researchers are allowed to combine quantitative and qualitative research methods in order to

comprehensively understand complex educational issues (Creswell & Plano Clark, 2018; Johnson & Onwuegbuzie, 2004).

The convergent mixed-methods research design was useful for the researcher in collecting quantitative and qualitative data simultaneously, analyzing the data separately, and then integrating the results during analysis. Quantitative data would give statistical facts concerning the relationship between socioeconomic status, educational resources, involvement of communities and families, and students' mathematics performance, while qualitative data would complement the quantitative data through documents' review.

The research was conducted in Kigali City, Rwanda, where secondary schools can be found in both rural and urban areas. Kigali City was chosen due to the existence of distinct differences in socioeconomic features, educational facilities, and learning resources, thus giving an adequate environment to evaluate gaps in mathematics performance among rural and urban schools.

3.2 Population, Sampling Procedure, and Sample Size

The target group consisted of Senior Five students registered in selected public secondary schools situated in rural and urban areas of Kigali City in the 2024–2025 school year. Senior Five students were chosen due to the reason that they had covered enough mathematics content according to the Competence-Based Curriculum and had stable academic backgrounds for analysis.

In total, 223 students took part in this study, out of which 116 students came from rural secondary schools while 107 students were from urban secondary schools. It was thought to be an appropriate number of students for the analysis using descriptive and inferential statistics.

Stratified random sampling design was used in this study. In the first place, schools which participated in the research were stratified based on geographic location (rural and urban). After this step, students were randomly sampled from each of the strata in order to ensure equal opportunity for all the participants who met the eligibility criteria. The process of stratification reduced sampling error and ensured equal representation of both urban and rural students, hence enhancing validity of comparison between the two groups (Creswell & Creswell, 2018).

3.3 Data Collection Methods

Two interrelated approaches were used in data collection: a questionnaire and documents review of the official school records. By utilizing these two approaches, the researcher was able to get primary and secondary data, which increased the credibility of the results (Bowen, 2009). The survey tool was used for all the chosen subjects in order to gather information about their socioeconomic status and background, level of education, and engagement within their communities and families. Using the survey tool, standardized numerical data was obtained that allowed comparing rural and urban students and doing a statistical analysis of correlations between the research variables. Document analysis involved the examination of the mathematics examination scores of the students during the third term of the academic year of 2024-2025, as well as relevant academic records stored in the schools where the research took place. The exam scores became the dependent variable of the research. They were objective measures of mathematics achievement.

3.4 Research Instruments

The research instruments that will be used in this study involve the use of two different research instruments; namely the structured questionnaire and the checklist for documentation review. The research instruments have been developed based on the objectives of research, conceptual framework and the variables identified from literature review. The research instruments have been validated and pre-tested before conducting the actual research process.

3.4.1 Structured Questionnaire

The structured questionnaire served as the principal instrument for collecting quantitative data from Senior Five students. It consisted of three sections.

Section A collected demographic information, including gender, school location and school type.

Section B comprised Likert-scale items measuring the three independent variables investigated in the study:

- Socioeconomic status and family background;
- Educational resources;

Responses were analyzed based on a five-point Likert scale where strongly agree is ranked 5 to strongly disagree is ranked 1 when the question was written in a positive format while the reverse was true in case of negatively formulated questions.

Questions in section C were two open-ended questions which gave the opportunity for the students to mention other factors affecting their performance in mathematics and the suggested solution to improve mathematics performance.

3.4.2 Document Review Checklist

A structured checklist was collected through the use of an organized checklist that involved the use of documents from the school. Such documents entailed information on the identity of the school, the location of the school, the identity code of the students, and the scores of the students in mathematics for the third term of the academic year 2024/2025. The use of the checklist facilitated systematic and standardized collection of documentary evidence in all the schools that participated in the study. The official records confirmed the validity of the dependent variable.

3.5 Data Collection Procedure

Ethical clearance and introduction letter was first sought from the University of Rwanda before conducting the study. Permission to conduct the study was obtained from the respective educational institutions and school management. The researcher personally visited the schools where the study was conducted and told the purpose of the study, informed participants of their rights, and gained consent before distributing the questionnaires. The questionnaire was distributed physically during the period of schooling, and the researcher was always available to provide clarifications on any questions that could arise without influencing the respondents. This ensured that the rate of non-responses would be kept low. Once the questionnaires had been administered and collected, the researcher looked at the records of the institution to obtain the mathematics examination grades of the students.

3.6 Data Analysis

The questionnaires that had been completed were analyzed in terms of validity, coded and then entered into Stata MP version 16.1 where data analysis took place. The descriptive analysis involved frequencies, percentage, mean and standard deviation to get an insight on the characteristics of the respondents and their socioeconomic status, educational resources, community and family involvement and mathematics achievement.

To determine the relationship between independent variables and dependent variables in the study, multiple linear regression was used to test how the socioeconomic status and family background, educational resources and community and family involvement predicted the mathematics achievement of the students. In this context, the mathematics examination scores were considered as the dependent variable and the three as independent variables.

The qualitative data collected through document analysis was analyzed using the objectives of the study. This integration enabled comparison of evidence from different data sources and generated a more comprehensive understanding of the factors contributing to disparities in mathematics achievement (Creswell & Plano Clark, 2018).

3.7 Ethical consideration

Ethics in the research are very crucial when conducting research on the performance of mathematics among students in rural and urban secondary schools in Kigali City. Permission for carrying out the research was sought from the concerned educational officials and also from the selected schools before collection of data. Consent was sought from the participants and the participation was voluntary with the freedom of withdrawing from the study at any time. Confidently and anonymity was ensured through not using the names of the participants and any other form of identity of the participants. All the data obtained were strictly used for academic reasons and kept safe from any unauthorized access. Also, the researcher ensures that all the participants are treated with dignity and all questions regarding their socio-economic backgrounds are posed in a tactful manner. Moreover, the researcher does not distort the results at all and reports everything objectively without distorting the participants' answers in any way.

4. Results and Discussion

4.1 Mathematics Performance by School Location and Type

The first research aim was to determine whether any performance disparity existed between rural and urban secondary school students in Kigali City with regard to their mathematics subject. Descriptive analysis results showed clear disparities in terms of students' academic performance based on school location and school type. Out of 223 students used in the study, 107 students were from urban schools while 116 students were from rural schools.

Table 1. Means, SD, and frequencies of students by location and schools

Location	Type Day	Boarding	Total
Urban	62.77193	84.74	73.037383
	8.7464637	8.6939106	14.022169
	57	50	107
Rural	53.125	75.95	64.931034
	8.6151294	8.2203241	14.191071
	56	60	116
Total	57.99115	79.945455	68.820628
	9.9080555	9.4808705	14.651942
	113	110	223

Source: Researcher's field data (2026), analyzed using Stata MP 16.1

Urban students achieved a mean mathematics score of 73.04% (SD = 14.02), whereas rural students obtained a mean score of 64.93% (SD = 14.19), representing a difference of 8.11 percentage **points** in favor of urban students. Across all respondents, the overall mean mathematics score was 68.82% (SD = 14.65).

Moreover, it was evident that students attending boarding schools performed better than those attending day schools. Students attending urban boarding schools scored a mean of 84.74%, while those attending urban day schools scored a mean of 62.77%. In addition, students attending rural boarding schools scored a mean of 75.95%, while students attending rural day schools scored a mean of 53.13%.

This kind of finding indicates that there is indeed a correlation between the location and type of school and performance in mathematics. It is clear that the good performance among urban students is because of availability of qualified teachers, learning materials, educational technology, and good environment for learning. Similarly, the good performance among boarding students is because of good study schedules and availability of school facilities.

The results are consistent with the international research literature indicating that city children perform better than rural children in mathematics owing to differences in school facilities and educational opportunities (Mullis et al., 2011; Zhao & Akiba, 2009). According to Wang et al. (2024), comparable findings have been obtained for students from urban and rural schools in Ghana (Agbenyega, 2013), South Africa (Spaull, 2013), and Uganda, where inequality in education facilities, teacher quality, and learning environment has contributed greatly to the mathematics achievement gap.

4.2 Influence of Socioeconomic Status and Family Background on Mathematics Performance

The first research objective sought to examine the influence of socioeconomic status and family background on students' mathematics performance. Multiple linear regression analysis revealed that socioeconomic status and family background had a positive and statistically significant effect on mathematics achievement. The regression coefficient for socioeconomic status was $\beta = 1.28$, indicating that a one-unit increase in socioeconomic status was associated with an increase of approximately 1.28 marks in mathematics performance while holding other variables constant. The 95% confidence interval ranged from 0.707 to 1.859, confirming statistical significance because the interval did not include zero.

The result reveals that students coming from rich backgrounds have an upper hand in math as compared to the ones from poor families. Families with rich backgrounds are able to afford textbooks, internet

services, good study environment, and tuition, which contributes to high levels of performance in schools.

Further information was revealed by students who responded to the open-ended questions on the questionnaire. The factors considered to affect performance in mathematics include family-based problems such as financial problems and parental support, and this was raised by 56 students.

The results confirm the Ecological Systems Theory formulated by Bronfenbrenner, as it suggests that family settings have a major impact on education performance (Paquette & Ryan, 2020). The results also corroborate the work of Wang et al. (2023) as they suggest that socioeconomic status is one of the most powerful factors affecting math performance across all educational systems in the world. Likewise, Egalite (2016) states that the level of parental income and education plays a crucial role in students' success.

Within the Rwandan context, the results are consistent with those found by Namara (2018) and Tabaro and Uwamahoro (2020), who found that students coming from economically secure families performed academically well due to more supportive parents and better learning environment. In this regard, the current study shows that socio-economic differences are among the most important factors causing mathematical inequality between rural and urban secondary schools in Kigali City.

4.3 Effect of Educational Resources on Mathematics Performance

The second objective investigated the impact of educational resources on the performance of the students in mathematics. Regression results showed that educational resources significantly and positively impacted on mathematics achievement. The regression coefficient was $\beta = 0.91$, meaning that one-unit increase in educational resources resulted in a 0.91 units increase in mathematics achievement scores, all other things being equal. The 95% confidence interval was between 0.432 and 1.391.

The results reveal that availability of textbooks, ICT infrastructure, competent teachers, adequate classroom space, and other sources of instruction has a significant impact on students' mathematics performance. Schools that have good resources provide conducive conditions for learning and teaching, hence improving students' comprehension of mathematical principles.

This was supported by the students' perception, where 42 respondents perceived availability of learning resources, including textbooks and computers, to be a major issue influencing their mathematics performance. On the other hand, 35 respondents cited teaching methodology as an important challenge.

The findings are consistent with Constructivist Learning Theory, which emphasizes that learning occurs through interaction with meaningful educational resources and supportive learning environments (Olusegun, 2015; Suhendi & Suhandi, 2018). They also support the findings of Zhao and Akiba (2009), who concluded that differences in educational resources explain a substantial proportion of rural–urban mathematics achievement gaps.

Similarly, studies conducted in Rwanda by REB (2020) and Mukeshimana and Andala (2024) found that schools with sufficient textbooks, ICT facilities, and qualified teachers consistently recorded higher mathematics achievement than under-resourced schools. The current research builds on this research by showing that educational resources are still among the best predictors of mathematics performance gaps in Kigali City secondary schools.

4.4 Role of Community and Family Involvement in Mathematics Performance

The third research objective attempted to evaluate the impact of community and family engagement on the success of students in mathematics. According to the results of the regression analysis, community and family engagement did not affect the academic success of students in mathematics significantly. Even though the coefficient was positive, it did not possess any statistical significance since the value of p was higher than 0.05, and the range of the 95% confidence interval was from -0.237 to 1.021 and included zero.

Nevertheless, the statements of the students prove the fact that the educational and social environment plays an important role in the academic success of the students. The students mentioned that a bad classroom environment (33), lack of teacher's help (14), and lack of help from peers (17) were the factors affecting their success in mathematics.

Table 2. Factors affecting the mathematics performance and frequencies of respondents

Factors affecting mathematics performance	Number of respondents
Lack of resources (books, computers, etc.)	42
Lack of teacher support	14
Family-related issues (financial difficulties, parental support, etc.)	56
Lack of motivation or interest	46
Teaching methods	35
Poor classroom environment	33
Peer pressure or lack of peer support	17
Other (please specify): _____	0

These findings show that though community and family involvement do not predict mathematics achievement directly, it acts as an indirect predictor through the effect on the motivation and attitude of students towards their learning. The findings are consistent with the School-Family Community Partnership Theory by Epstein & Salinas (2004) which postulates that partnership of schools, families, and community improves students' educational experience.

While the findings concur with those of Uzabakiriho et al. (2025), that there was a significant correlation between parental involvement and mathematics achievement in secondary school students in Rwanda, it shows that the influence of family and community involvement is relatively less important after controlling for socio-economic and educational variables. This implies that parental involvement alone is not sufficient to bridge structural inequalities related to poverty and lack of resources.

4.5 Multiple Linear Regression Analysis

In order to assess the joint effect of socioeconomic status and family background, educational resources, and community and family participation on mathematical performance, the multiple linear regression analysis was performed based on the full sample consisting of all 223 individuals. The significance of the regression model was found to be statistically significant, $F(3, 219) = 26.83$, $p < .001$, meaning that the set of independent variables is a significant predictor of mathematics performance. The value of R^2 for the regression model was 0.2687, which means that roughly 26.87% of variance in mathematics performance can be explained by the three independent variables. Adjusted R^2 was 0.2587.

Socioeconomic status and family background ($\beta = 1.28$, $p < .001$);

Educational resources ($\beta = 0.91$, $p < .001$).

Table 3. Multiple Linear Regression Results

Source	SS	df	MS	Number of obs	=	223
				F(3, 219)	=	26.83
Model	12808.2789	3	4269.42631	Prob > F	=	0.0000
Residual	34850.5462	219	159.134914	R-squared	=	0.2687
				Adj R-squared	=	0.2587
Total	47658.8251	222	214.679392	Root MSE	=	12.615

Marks	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
SocioEcoStatusFBackgroun	1.282848	.2923404	4.39	0.000	.7066878	1.859009
EdResources	.9116804	.2432993	3.75	0.000	.4321726	1.391188
CommunityFInvolvement	.3921521	.3190222	1.23	0.220	-.2365944	1.020899
_cons	34.62762	4.419237	7.84	0.000	25.91794	43.3373

Source: Researcher's field data (2026), analyzed using Stata MP 16.1

The involvement of community and family was found to have a positive influence on the performance in mathematics, although it was not significant statistically. The regression results in general show that the disparity between the performances of rural and urban secondary school students in mathematics can be attributed mostly to the disparities in their socioeconomic status and education resources.

5. Conclusion and Recommendations

5.1 Conclusion

It can be deduced from the findings of this study that the gap in mathematical performance of the students in the urban and rural secondary schools in Kigali City still exists with the urban secondary school students performing much better than the rural secondary school students in their mathematics. This is primarily due to the differences in the socioeconomic status of these students and availability of educational resources.

Further, it has been found from the findings of this study that the students whose parents have higher socioeconomic status tend to perform better in mathematics because they get help from home environment, educational assistance from their parents and educational resources. Thus, socioeconomic disparity is one of the key factors for the differences in the mathematics performance of the secondary school students.

This study also concludes that educational resources are fundamental determinants of mathematics performance. Schools that have sufficient textbooks, appropriate classroom facilities, and access to technology provide students with better learning opportunities and improved academic outcomes. Improving educational resources, particularly in rural schools, is therefore essential for enhancing mathematics performance.

Finally, despite the contribution of both the family and the community on the students' learning being beneficial, this contribution is not statistically significant when the factors of SES and educational resources are taken into consideration.

5.2 Recommendations

Based on the findings, the following recommendations are proposed for policymakers, school administrators, teachers, parents, and community stakeholders.

1. Ministry of Education and Rwanda Education Board

The Ministry of Education and REB, along with other educational stakeholders, should prioritize equitable

resource allocation for education in both rural and urban secondary schools. These resources include equitably distributed mathematics textbooks, ICT resources, internet access, teaching and learning materials, and improvements in classroom facilities especially in underprivileged rural schools. The policymakers should work on improving professional development services to teachers by giving them ongoing service training in learner-centred approaches, differentiated instruction, assessment approaches, and integrating ICTs in teaching mathematics. These policies should be backed up with incentives to draw quality teachers to rural schools as well as increasing funds in remedial services and mathematics clubs.

2. Support for socioeconomically disadvantaged students

Educational institutions, local government, and other stakeholders in education must come up with specific programs to assist students from poor families. Depending on the need and available resources, this program may include textbook sharing, monetary assistance to buy school books, access to electronic learning materials, mathematics tutoring, and study centers among others. This program should target students that encounter financial obstacles to learning. It will assist in overcoming the imbalance created by uneven distribution of household resources.

3. Strengthening family and community participation

The parents and community leaders should play a greater role by ensuring that students have supportive home environments, tracking their performance at school, fostering a positive attitude towards mathematics, and interacting with the school through frequent communications and participation in learning programs. Community institutions, government agencies, and the development partners must help the schools through resource mobilization, increasing access to ICT-based learning programs, and setting up community learning centers where students can benefit from academic assistance outside school hours.

4. School-level monitoring and student support

School leaders should advocate for cooperative lesson planning, peer coaching, classroom observations, and systematic evaluation of the quality of mathematics lessons. Mathematics teachers should utilize technology, interactive teaching strategies, and contextual learning opportunities that enhance problem-solving skills in their students.

5. Further research

Further research should be conducted into other variables, such as teacher credentials and experience, teaching methods, attitude and motivation of the students, class size, school administration, and previous academic performance, which could contribute to explaining any of the variations in mathematics achievement. Future research using schools in other parts of Rwanda and not only those in Kigali City could also be useful for validating findings.

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