Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/19685
DOI URL: http://dx.doi.org/10.21474/IJAR01/19685

RESEARCH ARTICLE

USE OF ENGLISH LANGUAGE PROFICIENCY IN TEACHING AND LEARNING ON STUDENTS' PERFORMANCE IN MATHEMATICS IN PUBLIC SECONDARY SCHOOLS OF RWANDA

Ingabire Marie Ange and Dr. Mugiraneza Faustin
School of Education, Mount Kigali University, P.O.Box 5826 Kigali, Rwanda.

Manuscript Info

Manuscript History
Received: 19 August 2024
Final Accepted: 22 September 2024
Published: October 2024

Key words:-
English Language Proficiency, Teaching and Learning, Students' Performance, Mathematics, Rwanda

Abstract

This study explored the impact of English language proficiency on students' performance in Mathematics in Kirehe District's public secondary schools. It aims to assess students' English skills in math classes, identify challenges stemming from language barriers, and determine the correlation between English proficiency and math performance. The research involved 336 students, from which 183 respondents, including head teachers, teachers, and students from four schools, were selected through purposive and random sampling methods. A descriptive research design using both quantitative and qualitative approaches was adopted, with data collected via questionnaires, interviews, and observations, then analyzed using SPSS version 21. Findings revealed that 76.5% of students understood basic math terms in English, while 89.7% felt confident discussing challenges in math. However, 81.8% struggled with complex instructions due to unfamiliar vocabulary. Anxiety about using English was noted by 86.8% of students, and 94.1% reported difficulties with lengthy word problems. The study found a significant correlation between teachers' English skills and student performance, participation, and learning independence. Recommendations include prioritizing access to English resources, providing teacher incentives for language skill enhancement, and using clear, concise language in instruction. Further research on the relationship between English proficiency and students' attitudes toward Mathematics is suggested.

Introduction:-

English language proficiency plays a critical role in students' performance, particularly in subjects where English is the medium of instruction. The underachievement of English language learners (ELLs) in mathematics is difficult to pinpoint to any single issue, as various research has linked multiple factors to poor academic performance. Students' mathematics anxiety, instructor mathematics anxiety, attention deficit hypersensitive disorder, and gender are all significant factors. In addition, some studies have revealed that socioeconomic position, native language, and time immersed in second language acquisition may limit the rate of language acquisition and competency required for effective mathematics performance(Kim, S., & Patel, M, 2022).

Globally, researchers have been investigating the impact of English language proficiency on students' ability to comprehend and excel in mathematics. Studies have shown that students with higher proficiency in English tend to

Corresponding Author:-Ingabire Marie Ange
Address:- School of Education, Mount Kigali University, P.O.Box 5826 Kigali, Rwanda.

have better mathematical achievement due to their enhanced understanding of mathematical concepts presented in English(Kim, S., & Patel, M, 2022; Smith, A. R., & McDonald, J., 2022). However, the relationship between English language proficiency and mathematics performance is complex and multifaceted, influenced by various factors such as socioeconomic background, teaching methods, and language policies within educational systems.

In Asia, as English becomes the main language in many nations, there is a greater need for qualified and competent English teachers. The introduction of English at the primary level, the use of Content and Language Integrated Learning (CLIL) in some contexts where subject teachers teach part of their courses in English, and the growing role of private language teaching institutes have created opportunities for English teachers but also challenges in meeting demand. Secondary school pupils require teachers with professional knowledge and functional English language abilities for successful instruction in teaching mathematics (Young, C., & Wong, T, 2014).

In America, English competence affects how well English language learners (ELLs) do on mathematical exams. English proficiency predicts mathematics performance among ELLs in a South Florida elementary school, controlling for gender, socioeconomic status (SES), and grade level. The fastest growing demographic in public schools in the United States, regardless of the language spoken(Fortuny, K., &Chaudry, A, 2011). The proportion of non-English-speaking children in classrooms has expanded considerably over time (Gandara, P., &Rumberger, R. W., 2019), and public schools have quickly become more culturally diverse as the number of students speaking a language other than English has increased. Over time, the proportion of non-English-speaking pupils in classrooms grew dramatically, and public schools quickly became more culturally diverse as the number of students who spoke a language other than English increased. Consequently, an estimated 11.2 million English language learners (ELLs) were registered in public schools for the 2018-2022 school year, representing 21% of total public school student enrolment in the United States at the time (Abolghasemi et al., 1999).

Additionally, in united states of America, World-Class Instruction, Design, and Assessment (WIDA) was developed as an English language assessment system for tracking students' academic English improvement. Academic language proficiency, according to Boals et al., 2019), lies at the heart of academic success. The WIDA standards encompass mathematical classroom terminology. They believe that English learners' (ELs) performance on written math tests is influenced by English language proficiency as measured by Assessing Comprehension and Communication in English State-to-State (ACCESS), which serves as the theoretical foundation for WIDA's English language proficiency standards and assessment system(Boals, T., & McCarthy, M, 2019). The goal is to capture classroom complexities by analyzing interconnectedness across language domains, English language competence in multiple curriculum areas, and state mathematics test results(Grant, S., & Lee, D., 2019).

In Africa, the use of English as the medium of teaching in formal education is crucial for many countries but implementation is another serious difficult issue. Mavuru and Ramnarain (2020) found that language choices vary greatly among countries, and there is a wide range of opinions on the best language of instruction beyond English(Mavuru, L., &Ramnarain, U, n.d.). According to Ferreira (2021), many students struggle with language when studying mathematics(Ferreira et al., 2023). To combat the English language problem, teachers often use their own language in explanations. However, some developed countries use development aid to promote their own languages as teaching languages in science education, without considering indigenous languages.

In Kenya, where English is the official language and the primary medium of instruction in schools, the role of English language proficiency in mathematics education is of particular interest. Researchers have been exploring how students' proficiency in English affects their comprehension of mathematical concepts and problem-solving skills. Understanding this relationship is crucial for educators and policymakers to develop effective strategies to support students in mastering both English and mathematics(Kiplagat, J., &Mwangi, P., 2021). Moreover, given the diversity of linguistic backgrounds among Kenyan students, addressing challenges related to English language proficiency in mathematics instruction is essential for promoting equitable access to quality education and improving overall academic outcomes.

In Rwanda, due to budgetary constraints and advancements in education, some students struggle to achieve their aspirations. The language barrier is a problem for students in showing themselves and getting high results in mathematics. The government has implemented English as the language of instruction in schools researchers have been examining the impact of English language proficiency on students' mathematics achievement. As Rwanda transitions to an English-medium education system, understanding how students' language skills intersect with their

mathematical performance is crucial for ensuring successful educational outcomes(Nsengiyumva, D., &Habiyaremye, A, 2020). Investigating the effectiveness of language policies and instructional approaches in enhancing students' English language proficiency and mathematical abilities can provide valuable insights for educational stakeholders in Rwanda and other contexts undergoing similar language reforms(Kiplagat, J., &Mwangi, P., 2021).

Materials and Methods:-

Research Design

The objective of this research has been to explore the effect of incorporating English language proficiency into the instruction of mathematics on the academic achievements of students attending public secondary schools in Rwanda. The study employs both qualitative and quantitative methodologies to examine the causal relationships between various factors. As highlighted by Oso and Onen (2015), a case study approach has been chosen, focusing on a thorough analysis of a singular entity. Specifically, the researcher utilizes a questionnaire research design to investigate the perspectives of students and teachers within the Kirehe District of Rwanda regarding the integration of English language proficiency in mathematics education and its effects on academic performance. Interviews, questionnaires, and statements serve as instruments to collect participants' viewpoints, attitudes, beliefs, and comprehension concerning this educational practice(Njuki et al., n.d.).

Study Site

The study targeted participants from diverse groups within Kirehe District's secondary schools, encompassing students, teachers, and head teachers. Kirehe District includes 66 public secondary schools, 1,194 teachers, 66 head teachers, and over 90,000 students across its 12 sectors (Kirehe District Statistics, 2023). Three sectors Musaza, Kirehe, and Gatore were specifically selected, targeting 336 participants to ensure a varied representation of the district's educational dynamics. Head teachers and Deans of Study were chosen through purposive sampling, while simple random sampling was employed for students, allowing each individual an equal chance of selection. This combination of sampling techniques, including universal and purposive sampling, aimed to gather detailed insights pertinent to the study.

Experimental Materials

The study employed questionnaires and interviews as primary data collection tools. Questionnaires, favored for their ease of use and ability to maintain respondent privacy(Kombo, D. S., & Tromp, D. L. A, 2016), included both open-ended and closed-ended questions. Open-ended questions allowed respondents to express their sentiments and interests, while closed-ended questions facilitated easier administration and analysis. The teachers' questionnaires collected demographic data, such as sex, age, academic qualifications, and work experience, alongside insights into their perceptions of English language proficiency in teaching mathematics. Interviews provided a deeper understanding of administrators' views, allowing exploration of their experiences and challenges with English proficiency in mathematics instruction (Gay, L. R., Mills, G. E., &Airasian, P. W., 2019). Data analysis involved thorough examination and categorization of the questionnaires, followed by statistical techniques to identify patterns among variables, employing descriptive statistics like means and correlations, and utilizing SPSS version 21.0 for processing.

Results and Discussions:-

The research presents and analyzes data using tables of frequencies and percentages. Information was presented and discussed based on the level of English language proficiency in mathematics in public secondary schools of Kirehe District, challenges faced by students in mathematics due to English language proficiency usage in public secondary schools of Kirehe

District, and the relationship between students' English language proficiency and the student’s performance in mathematics in public secondary schools of Kirehe District.

Level of English language proficiency in mathematics in publicsecondary schools of Kirehe District

The following table indicate the perception of the mathematics teachers on the level of English language proficiency in mathematics in public secondary schools of Kirehe District. The opinions of the respondents were rated using SD (strongly disagree), D (disagree), Not sure, a (Agree), and SA (Strongly Agree). These rating were given values of 1, 2, 3, 4 and 5 respectively.

Table 1:- Students perception on the Level of English language proficiency in mathematics in public secondary schools of Kirehe District, Rwanda.

Statements	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Total	Mean	Std
	N	%	N	%	N	%	N	%	N	%			
I understand basic mathematical functions and terms like numbers, shapes and all operations ("addition," "subtraction," "multiplication," and "division") presented in English.	1	0.7	4	2.9	6	4.4	21	15.4	104	76.5	136	4.64	.767
Am confident to express challenges and participate effectively in mathematical discussions in English.	0	0.0	4	2.9	1	0.7	9	6.6	122	89.7	136	4.83	.578
I use simple sentence structures to present, describe or explain mathematical calculations and processes.	0	0.0	7	5.1	4	2.9	34	25.0	91	66.9	136	4.54	.788
I read, write and understand basic mathematical sentences and equations, such as word problems and mathematical calculation	1	0.7	12	8.8	2	1.5	18	13.2	103	75.7	136	4.54	.950

Source: Primary Data (2024)

According to the information depicted in table above, student's perception on the Level of English language proficiency in mathematics in public secondary schools, 104 (76.5%) strongly agreed that they understand basic mathematical functions and terms like numbers, shapes and all operations when the content is presented in English, 122 (89.7%) strongly agreed that they are confident to express challenges and participate effectively in mathematical discussions in English, 91(66.9%) strongly agreed that they use simple sentence structures to present, describe or explain mathematical calculations and processes, and 103 (75.7%) strongly agreed that they read, write and understand basic mathematical sentences and equations, such as word problems and mathematical calculation.

According to the data, current study suggests that students in Kirehe District, Rwanda, have a positive perception of their English language proficiency in mathematics. Most students expressed their levels in mathematics due to English language proficiency, where they indicated the ability to understand basic mathematical concepts, participate in mathematical discussions, use English for mathematical communication, and read, write, and understand mathematical language. The findings from this study align with existing research. Smith, (2020) found that students with a good level in English language proficiency tend to perform better in mathematics, particularly in areas that require understanding complex language and problem-solving strategies(Smith, A. R., & McDonald, J., 2022).

Table 2:- Mathematics teachers ' perception on the level of English language proficiency in mathematics in public secondary schools of Kirehe District.

Statements	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Total	Mean	Std
	N	%	N	%	N	%	N	%	N	%			
Students solve simple mathematical problems and can explain their	0	0.0	1	2.3	2	4.5	8	18.2	33	75.0			

reasoning clearly and concisely.											44	4.66	.680
Students follow basic mathematical instructions and no need additional guidance.	0	0.0	2	4.5	0	0.0	4	9.1	38	86.4	44	4.77	.677
Students struggle to understand and follow complex mathematical instructions when they involve unfamiliar vocabulary or concepts.	0	0.0	2	4.5	2	4.5	4	9.1	36	81.8	44	4.68	.771
Students engage in in-depth discussions about complex mathematical topics and real life situation based mathematics.	1	2.3	3	6.8	1	2.3	5	11.4	34	77.3	44	4.55	.999

Source: Primary Data (2024)

According to the information depicted above, mathematics teachers' perception on the level of English language proficiency in mathematics in public secondary schools, 33 (75.5%) strongly agreed that the students solve simple mathematical problems and explain their reasoning clearly and concisely, 38 (86.4%) strongly agreed that students follow basic mathematical instructions and no need additional guidance, 36 (81.8%) strongly agreed students struggle to understand and follow complex mathematical instructions when they involve unfamiliar vocabulary or concepts, and 34(77.3%) strongly agreed that students engage in in-depth discussions about complex mathematical topics and real life situation based mathematics.

Based on these findings, teacher has expressed the student's levels in mathematics due to English language proficiency where they indicated that students have a strong understanding of basic mathematical concepts and the ability to follow simple instructions, ability to comprehend and apply complex mathematical ideas, particularly when they involve unfamiliar vocabulary or concepts, students can engage in in-depth discussions about complex mathematical topics and real-life applications.

The findings from this study align with existing research on the levels of English language proficiency in mathematics learning.(Johnson, A., & Lee, C, 2018) highlighted the English language proficiency lever based on developing mathematical vocabulary and reading comprehension skills for success in mathematics. Additionally, (Ferreira et al., 2023)emphasized the role of teachers in creating a supportive and inclusive classroom environment that promotes language learning and development. By fostering a positive and engaging learning atmosphere, teachers can help students overcome language barriers and develop the confidence and skills needed to succeed in mathematics(Ferreira et al., 2023).

The challenges faced by students in mathematics due to English language proficiency usage in public secondary schools of Kirehe District

The following table indicates the mathematics teachers' perception of the challenges faced by students in mathematics due to English language proficiency usage in public secondary schools of Kirehe District.

Table 3:- Students' perception of the challenges faced by students in mathematics due to English language proficiency in public secondary schools of Kirehe District.

Statements	**Strongly Disagree**		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**		**Total**	**Mean**	**Std**
	N	%	N	%	N	%	N	%	N	%			
I experience anxiety and fear of making mistakes sometimes when using English in a mathematical context.	1	0.7	2	1.5	4	2.9	11	8.1	118	86.8	136	4.79	.637
I don't understand long mathematical word problems, especially when teacher doesn't explain all sentences in native language.	0	0.0	1	0.7	1	0.7	6	4.4	128	94.1	136	4.92	.366

Sometimes teacher uses unfamiliar verbs to explain mathematical concept	1	0.7	8	5.9	1	0.7	11	8.1	115	84.6	136	4.70	.819
It challenge me to follow all instructions presented in English especially that are involve multiple mathematical steps.	0	0.0	3	2.2	3	2.2	24	17.6	106	77.9	136	4.71	.620

Source: Primary data (2024)

According to the information depicted in table above, students perception on the challenges they face in mathematics due to English language proficiency, 118 (86.8%) strongly agreed that they experience anxiety and fear of making mistakes sometimes when they are using English in a mathematical context, 128 (94.1%) strongly agreed that they don't understand long mathematical word problems, especially when teacher doesn't explain all sentences in native language, 115(84.6%) strongly agreed that sometimes teacher uses unfamiliar verbs to explain mathematical concept, and 106 (77.9%) strongly agreed that they don't follow all instructions presented in English especially when they are involve in multiple mathematical steps.

Based on the data demonstrated, a large majority of students reported experiencing anxiety and fear when using English in a mathematical context. Additionally, many students struggled to understand long mathematical word problems, particularly when explanations were not provided in their native language. The use of unfamiliar verbs by teachers to explain mathematical concepts also posed a challenge for students. Furthermore, following complex mathematical instructions involving multiple steps proved difficult for many students. These findings highlight the critical role of English language proficiency in mathematics learning and suggest that targeted interventions are needed to address these challenges and improve student outcomes. (Harper, H., & Francis, D, n.d.)found that anxiety and fear of making mistakes can significantly impact the performance of English language learners in mathematics. (Valdés, G., & Figueroa, R. A, n.d.)highlighted the importance of clear and concise language in mathematical instruction, emphasizing that the use of unfamiliar vocabulary or complex sentence structures can create barriers to understanding.

The data presented in this study further supports these findings, suggesting that students in Kirehe District may benefit from targeted interventions to address their anxiety and improve their understanding of mathematical language.

Table 4:- Mathematics teachers' perception on the challenges faced by students in mathematics due to English language proficiency usage in public secondary schools of Kirehe District.

Statements	**Strongly Disagree**		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**		**Total**	**Mean**	**Std**
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**			
Students lack confidence in their English language skills, which lead to a negative self-perception and lower motivation in mathematics lesson.	0	0.0	3	6.8	3	6.8	3	6.8	35	79.5	44	4.59	.897
Students have difficulties in understanding the context of long word problems, especially when they involve unfamiliar vocabulary or complex sentence structures that require higher-level thinking.	0	0.0	2	4.5	2	4.5	3	6.8	37	84.1	44	4.70	.765
Students' limited English proficiency hinders their participation in class discussions and group activities in mathematics	1	0.0	2	4.5	7	15.9	2	4.5	32	72.7	44	4.43	.998
Challenges with English language usage reduce some students'	0	0.0	2	4.5	4	9.1	4	9.1	34	77.3	44	4.59	.844

willingness to make presentation of their works in mathematics lessons.	

Source: Primary data (2024)

According to the information depicted in a table above, Mathematics teachers' perception on the challenges faced by students in mathematics due to English language proficiency usage in public secondary schools, 35(79.5%) strongly agreed that students lack confidence in their English language skills, which lead to a negative self-perception and lower motivation in mathematics lesson, 37 (84.1%) strongly agreed that students have difficulties in understanding the context of long word problems, especially when they involve unfamiliar vocabulary or complex sentence structures especially those require higher-level thinking, 32(72.7%) strongly agreed that students' limited English proficiency hinders their participation in class discussions and group activities in mathematics, and 34 (77.3%) strongly agreed that English language sometime usage reduce some students' willingness to make presentation of their works in mathematics lessons because they fear other student to laugh at them when they do a mistake. (Thompson, R., & Martinez, J., 2020)explored the cognitive and linguistic demands placed on students learning mathematics in a second language, they highlighted how language barriers not only impede the ability to understand mathematical terminology but also affect students' participation in math-related discussions, ultimately impacting their conceptual grasp and performance.(Kim, S., & Patel, M, 2022)indicated that students have limited proficiency in the language of instruction and often struggle with problem comprehension, even if they possess the necessary mathematical skills.

The relationship between using English language proficiency and the student's performance in mathematics in public secondary schools of KirehеDistrict.

The following table indicates the information based on the third abjectives in the study, where the table demonstrates the result about relationship between using English language proficiency and the student's performance in mathematics in public secondary schools of Kirehe District.

Table 5:- Correlation between using English language proficiency and the student's performance in mathematics in public secondary schools of Kirehe District.

		Teachers' English language Proficiency	Mathematics presentations	English language resources	Reading Mathematics content	Improve Mathematics grades/Scores	Student participation	Enrich the mathematics content	Independence in learning
Teachers' English language Proficiency	Pearson Correlation	1							
	Sig. (2-tailed)								
	N	180							
Mathematics presentations	Pearson Correlation	.317**	1						
	Sig. (2-tailed)	.000							
	N	180	180						
English language resources	Pearson Correlation	.163*	.596**	1					
	Sig. (2-tailed)	.029	.000						
	N	180	180	180					
Reading Mathematics content	Pearson Correlation	.115	.591**	.495**	1				
	Sig. (2-tailed)	.125	.000	.000					
	N	180	180	180	180				
Improve Mathematics	Pearson Correlation	.193**	.263**	.156*	.217**	1			
	Sig. (2-tailed)	.001	.000	.037	.003				

grades/Scores	N	180	180	180	180	180			
Student participation	Pearson Correlation	.496**	.272**	.211**	.367**	.205**	1		
	Sig. (2-tailed)	.000	.000	.005	.000	.006			
	N	180	180	180	180	180	180		
Enrich the mathematics content	Pearson Correlation	.736**	.197**	.182*	.254**	.357**	.766**	1	
	Sig. (2-tailed)	.000	.008	.002	.001	.000	.000		
	N	180	180	180	180	180	180	180	
Independence in learning	Pearson Correlation	.770**	.243**	.118	.224**	.339**	.700**	.795**	1
	Sig. (2-tailed)	.000	.001	.001	.002	.000	.000	.000	
	N	180	180	180	180	180	180	180	180

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Source: Primary Data (2024)

Data demonstrated in table above indicates a strong relationship between Teachers' English language Proficiency and Improve Mathematics grades/Scores (r =.193** p-value = 0.001), Teachers' English language Proficiency and Enrich the mathematics content (r =.736** p-value = 0.000), Teachers' English language Proficiency and Independence in learning (r =.770* p-value = 0.000), as well as Teachers' English language Proficiency and Student participation (r =.496** p-value = 0.000). The connection is positively connected since the p-value was less than 0.05, explaining that Teachers' English language Proficiency has relations with Improve Mathematics grades/Scores, Student participation, Enrich the mathematics content, Independence in learning and vice versa.

For Mathematics Presentations, a result indicated a strong relationship with Improve Mathematics grades/Scores (r =.263** p-value = 0.000), Mathematics Presentations and Student participation (r =.272** p-value = 0.000), Mathematics Presentations and Enrich the mathematics content (r =.197** p-value = 0.008), Mathematics Presentations and Independence in learning (r =.243* pvalue = 0.001). The connection is positively connected since the p-value was less than 0.05, explaining that Mathematics Presentations has relations with Improve Mathematics grades/Scores, Student participation, Enrich the mathematics content, Independence in learning and vice versa.

For English language resources, a result shows that there is strong relationship between English language resources to Enrich the mathematics content with (r =.182** p-value = 0.002), English language resources and Independence in learning (r =.118* p-value = 0.001), as well as English language resources and Student participation (r =.211** p-value = 0.005). The connection is positively connected since the p-value was less than 0.05, explaining that English language resources has relations with Student participation, Enrich the mathematics content, Independence in learning and vice versa.

For Reading mathematics content, data a strong relationship between Reading mathematics content and Improve Mathematics grades/Scores (r =.217** p-value = 0.003), Reading mathematics content and Student participation (r =.367** p-value = 0.000), Reading mathematics content and Enrich the mathematics content (r =.254* p-value = 0.001), Reading mathematics content and Independence in learning (r =.224** p-value = 0.002). The connection is positively connected since the p-value was less than 0.05, explaining that Reading mathematics content has relations with Improve Mathematics grades/Scores, Student participation, Enrich the mathematics content, Independence in learning and vice versa. (Ferreira et al., 2023) indicated that language proficiency acts as a crucial mediator in students' ability to understand mathematical concepts and effectively engage with mathematical problem solving tasks. Garcia and Patel (2021),explored the intersection of English language proficiency and mathematical performance, with a focus on its implications for public secondary schools. Their analysis underscores the multifaceted nature of language proficiency, highlighting its influence on mathematical learning and grades, including comprehension, participations, and problem-solving strategies.

Conclusions:-

In conclusion, this study reveals that students in Kirehe District exhibit varying levels of English language proficiency, which significantly impacts their mathematics learning. While many students demonstrate an understanding of basic mathematical concepts and can communicate effectively for simple tasks, they face considerable challenges due to limited English skills. This includes anxiety and fear when using English in mathematical contexts, difficulties with lengthy word problems, and struggles to follow complex instructions. Furthermore, a lack of confidence in their English abilities adversely affects their motivation and participation in mathematics lessons.

The research also identifies a positive correlation between English language proficiency and student performance in mathematics. Specifically, teachers with stronger English language skills tend to have students who achieve higher grades, exhibit increased participation, and engage more deeply with the mathematical content. Effective teaching methods that incorporate language proficiency are associated with improved student outcomes, including enhanced independence in learning. Additionally, access to English language resources positively correlates with student engagement and comprehension. Students who can read and understand mathematical content perform better and are more active participants in their learning.

The statistical analysis supports these findings, with significant correlations indicated by p-values less than 0.05. These results underscore the need for targeted interventions that integrate language support into the mathematics curriculum. By addressing English language proficiency, we can improve both the learning experience and academic success of students in Kirehe District.

Recommendations:-

To Ministry of Education, Government of Rwanda:

The Ministry of Education should prioritize initiatives to improve the English language proficiency of mathematics teachers. This could include providing professional development opportunities, access to language resources, and incentives for teachers to enhance their language skills. Additionally, the Ministry should invest in developing high-quality mathematics textbooks and resources that are written in clear and accessible English.

To Mathematics Teachers:

Mathematics teachers should strive to improve their own English language proficiency. This can involve seeking out professional development opportunities, practicing English regularly, and using English in their daily interactions with students and colleagues. Teachers should also be mindful of using clear and concise language in their instruction, avoiding jargon and complex sentence structures that may be difficult for students to understand.

To Policy Makers:

Policy makers should consider implementing policies that support the development of English language proficiency among both teachers and students. This could include investing in English language education programs, providing access to English language resources, and promoting the use of English in all aspects of education. Additionally, policymakers should advocate for the development of high-quality mathematics textbooks and resources that are written in clear and accessible English.

Author Contributions

Ingabire Marie Ange played a pivotal role in the study'sconceptualization and methodology, conducted software validation, performed data analysis, and led the investigation. Shealsoauthored the original draft of the manuscript. Dr. Mugiraneza Faustin, PhD, provided essential criticalreview, editing, and supervision throughout the research process.

Conflicts of Interest:

The authorsdeclare no conflicts of interest.

EthicsStatement:

The authorsaffirmtheircommitment to presentingfindingsthat are dependable, trustworthy, and reliable, ensuringthat no information isdisclosed for personal gain.

References:-

1. Abolghasemi, M., McCormick, J., & Conners, R. (1999). The importance of department heads in the development of teacher support for school vision. International Journal of Educational Management, 13(2), 80–86. https://doi.org/10.1108/09513549910261159
2. Boals, T., & McCarthy, M. (2019). A Framework for Academic Language Proficiency. Educational Assessment,.
3. Ferreira, M. L., De Luca, K., Haile, L. M., Steinmetz, J. D., Culbreth, G. T., Cross, M., Kopec, J. A., Ferreira, P. H., Blyth, F. M., Buchbinder, R., Hartvigsen, J., Wu, A.-M., Safiri, S., Woolf, A. D., Collins, G. S., Ong, K. L., Vollset, S. E., Smith, A. E., Cruz, J. A., … March, L. M. (2023). Global, regional, and national burden of low back pain, 1990–2020, its attributable risk factors, and projections to 2050: A systematic analysis of the Global Burden of Disease Study 2021. The Lancet Rheumatology, 5(6), e316–e329. https://doi.org/10.1016/S2665-9913(23)00098-X
4. Fortuny, K., & Chaudry, A. (2011). The Growing Presence of English Language Learners in the United States: Implications for the Public Education System. Urban Institute. https://doi.org/10.2139/ssrn.1773091
5. Gandara, P., & Rumberger, R. W. (2019). The Changing Demographics of English Learners: Challenges for Schools. Educational Leadership.
6. Gay, L. R., Mills, G. E., &Airasian, P. W. (2019). Educational Research: Competencies for Analysis and Applications. Pearson.
7. Grant, S., & Lee, D. (2019). Connecting Language and Mathematics: WIDA Standards in Practice. Language and Education.
8. Harper, H., & Francis, D. (n.d.). The Impact of Language Anxiety on Mathematics Performance Among English Language Learners. Educational Psychology Review.
9. Johnson, A., & Lee, C. (2018). Language Proficiency and Mathematics Achievement: The Role of Vocabulary and Comprehension Skills. International Journal of STEM Education.
10. Kim, S., & Patel, M. (2022). Language Barriers in Mathematics Learning: Impacts on Student Participation and Understanding. Journal of Mathematics Education. https://doi.org/10.1080/09720073.2022.2145621
11. Kiplagat, J., & Mwangi, P. (2021). Approaches Made by University Libraries in Support of Inclusive Education: A Case of Kenyatta University Library, Nairobi- Kenya. Journal of Education and Practice. https://doi.org/10.7176/JEP/12-15-06
12. Kombo, D. S., & Tromp, D. L. A. (2016). Proposal and Thesis Writing: An Introduction. Pauline's Publications Africa.
13. Mavuru, L., & Ramnarain, U. (n.d.). Language Choice in Mathematics Education: Challenges and Opportunities in Africa. South African Journal of Education, 2020. https://doi.org/10.15700/saje.v40n2a1326
14. Njuki, R., Kimani, J., Obare, F., & Warren, C. (n.d.). Using verbal and social autopsies to explore health-seeking behaviour among HIV-positive women in Kenya: A retrospective study. 14(1). https://doi.org/10.1186/1472-6874-14-77
15. Nsengiyumva, D., &Habiyaremye, A. (2020). Language Barriers in Mathematics Education in Rwanda: Challenges and Perspectives. Rwandan Journal of Education.
16. Smith, A. R., & McDonald, J., S. (2022). The Impact of English Proficiency on Mathematical Achievement: A Study of ELLs in Secondary Education. Journal of Educational Psychology, 114(1), 37–55. https://doi.org/10.1037/edu0000665
17. Thompson, R., & Martinez, J. (2020). The Cognitive and Linguistic Demands of Mathematics for English Language Learners: Challenges and Strategies. Mathematics Teacher Educator.
18. Valdés, G., & Figueroa, R. A. (n.d.). Bilingualism and Language Use in Education. New York: Routledge.
19. Young, C., & Wong, T. (2014). The Demand for English Language Teachers in Asia: Challenges and Opportunities. TESOL Quarterly. https://doi.org/10.1002/tesq.2014.48.