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RESEARCH ARTICLE

INFLUENCE OF PEER LEARNING PRACTICES ON STUDENT ACADEMIC COMPETENCES IN MATHEMATICS IN PUBLIC SECONDARY SCHOOLS IN RWANDA A CASE OF RUHANGO DISTRICT

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Abstract

Background: Peer learning recognized as a form of collaborative learning has garnered significant attention in educational settings due to its potential to enhance students' understanding and retention of subject matter. The purpose of this study was to investigate the influence of peer learning practices on student academic competences in mathematics in public secondary schools in Rwanda. This study was guided by three specific objectives and three research hypotheses focusing on peer learning practices and their influences on student academic competences in mathematics in Public secondary schools.

Methods and Materials: The study utilized a mixed-methods research design. The target population included 5 sector education officers, 20 secondary school head teachers, 40 mathematics teachers, and 1435 students from 20 secondary schools in Ruhango District. Both probability and non-probability sampling procedures were employed to determine the sample size. Specifically, stratified random sampling was used for selecting education officers, head teachers, and mathematics teachers, while convenience sampling was employed for selecting students. Data collection involved the use of interview guides for head teachers and questionnaires for teachers and students. Qualitative data were analyzed using statistically techniques, while quantitative data were analyzed with IBM SPSS.

Results: Results pertaining to the relationship between peer learning practices and academic competences in mathematics revealed significant findings. 93.1% of students acknowledged that peer-learning practices positively influenced their mathematics grades, while 91.5% agreed that these practices enhanced their problem-solving skills. Additionally, 94.5% of respondents affirmed that peer-learning practices improved their conceptual understanding of mathematics, while 92% agreed that such practices increased their peer interaction and collaboration skills. Furthermore, 94.5% of students acknowledged that peer-learning practices enhanced their metacognitive skills. A strong relationship was established between students' academic competences and peer learning practices where Pearson coefficient of correlation states the correlation ($r=0.860$, $p\text{-value}<0.001$), Peer learning practices and students problem solving skills (0.608^{**} , $p\text{-}$

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value < 0.001), Students academic abilities and peer learning practices ($r = 0.876^{**}$, p-value < 0.001). changes or improvements in their academic competences due to peer learning practices ($r = 0.705^{**}$, p-value < 0.001) The association is related because p-value was less than 0.05, explaining that peer learning practices influence students' academic competences at high level. The researcher suggests further investigation to explore the influence of students' academic competences on their overall academic performance in public secondary schools in Rwanda, allowing for comparative analysis. Overall, the results pertaining to the relationship between peer learning practices and students' academic competences in mathematics establish a strong correlation. The data consistently demonstrate a high degree of positive correlation between peer learning practices and students' math grades, problem-solving skills, conceptual understanding, peer interaction and collaboration skills, metacognitive abilities, and overall academic confidence.

Conclusion: It is essential to acknowledge that the effectiveness of these practices may vary based on contextual factors and individual differences among students. Effective facilitation and a supportive learning culture are crucial for realizing the full benefits of peer learning practices, as well as for addressing potential challenges and variations in outcomes.

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Introduction:-

Education is a cornerstone of human development and progress, and mathematics, as a fundamental subject, plays a central role in shaping the intellectual and problem-solving abilities of students worldwide (Boaler, 2016). Ensuring that students achieve high levels of proficiency in mathematics is a shared goal for countries around the globe (OECD, 2018). Public secondary schools serve as crucial institutions where these competences are nurtured and developed. Achieving proficiency in mathematics is a shared aspiration among nations, as it empowers individuals and contributes to socioeconomic progress worldwide (World Bank, 2019).

Researchers have identified various factors that contribute to the effectiveness of peer learning practices, including peer interaction, group dynamics, teacher facilitation, and institutional support (Johnson et al., 2014). Studies have also explored the role of technology-mediated peer learning, such as online collaborative platforms and virtual learning communities, in extending the reach and impact of peer learning beyond traditional classroom settings (Veletsianos & Russell, 2013). Researchers have emphasized the importance of integrating culturally relevant peer learning strategies into the Rwandan educational context to enhance student engagement and achievement (Izere, 2020). However, while there is growing recognition of the potential benefits of peer learning practices in mathematics education in Rwanda, there is a need for empirical research that delves into their influence on students' academic competences in mathematics within the distinct context of Rwandan public secondary schools. The main objective of this research was to investigate the influence of peer learning practices on the students' academic competences in Mathematics in public secondary schools in Ruhango District in Rwanda. It was guided by the following specific objectives:

1. Investigating the extent to which peer-learning practices influence students' academic competences in mathematics in Ruhango District, Rwanda.
2. To assess academic competences of students in mathematics that is due to peer learning practices in Public secondary schools Ruhango District, Rwanda.
3. To determine the relationship between peer learning practice and academic competences in mathematics in public secondary school Ruhango District, Rwanda.

Theoretical Framework

Social Constructivist Theory

The concept of learning through peer learning is based on a social constructivist view of learning that emphasizes the role of the students to generate learning where students coach peers through social interaction within their zones

of proximal development (Vygotsky, 2014 as cited Clarkson & Luca 2012). Rather than applying a stimulus/response process, users are actively engaged in making meaning through cognitive accommodation and/or assimilation. (Piaget, 1969, as cited Clarkson & Luca 2012). Social constructivist approaches can include reciprocal teaching, peer collaboration, cognitive apprenticeships, problem-based instruction, web-quests, anchored instruction and other methods that involve learning with others (Kim, 2011).

Holt and Willard-Holt (2010) emphasize the concept of dynamic assessment, which is a way of assessing the true potential of learners that differs significantly from conventional tests. Here the essentially interactive nature of learning is extended to the process of assessment. Rather than viewing assessment as a process carried out by one person, such as an instructor, it is seen as a two-way process involving interaction between both instructor and learner. The role of the assessor becomes one of entering into dialogue with the persons being assessed to find out their current level of performance on any task and sharing with them possible ways in which that performance might be improved on a subsequent occasion. Thus, assessment and learning are seen as inextricably linked and not separate processes (Holt and Willard-Holt 2010).

Vygotsky argued that learning comes about through social negotiation within a cultural context, with language as the primary enabling tool. This social constructivist philosophy has been expanded on recently, introducing the notion of cognitive apprenticeship (Brown, Collins, & Duguid, 2010 as cited Clarkson & Luca 2012) through which students learn in a manner similar to traditional apprenticeships. The students access expertise through mentors, whose role is to facilitate rather than teach, and the aim of learning is to solve realistic and practical problems in an authentic setting. For a peer tutor, this setting is a very realistic human setting. Just as in traditional apprenticeships, learners engage in activities 'on-the-job' rather than through the didactic teaching of abstract concepts. The argument is that students are better equipped to approach non-familiar problems and produce solutions that are appropriate to a given culture.

Perry's Theory of Cognitive Development

Perry's theory of cognitive development may be seen as an extension of Piaget's childhood development model. A key concept of any theory of cognitive development, and one that is frequently lost in such conversations, is that cognitive development may be understood as the way individuals make meaning of the world around them. The critical distinction here is between how a person thinks and what they are actually thinking about. In employing cognitive development theory, it is essential to focus on the "how" rather than the "what." The context in which Perry developed his model is also important to recognize, particularly because of its distinctions with contemporary campus life. He developed his theory while working as a professor at Harvard during the 1950's and 1960's (Love & Guthrie, 1999 as cited Clarkson & Luca 2012).

Previous meta-analyses of influence of peer learning on academic achievement have been plagued with theoretical and methodological flaws. Specifically, these studies have not adopted both fixed and mixed effects models for analyzing the effect size; they have not evaluated the moderating effect of some commonly used parameters, such as comparing same-age reciprocal peer learning, same-age nonreciprocal, or cross-age peer learning; considered the educational level of tutee or tutor; or properly addressed publication bias. Most studies are confined to specific populations and particular subjects (mainly mathematics and reading), and some studies are confounded by other types of intervention (such as cooperative learning or adult-led tutoring). A study conducted by Webb (2011) found that when students did not understand a teacher's explanation, peers were often able to provide explanations in words that were more easily understood. Othman (2019) conducted a study to gain understanding of significant mechanisms of Peer learning (PL) with respect to the balance between enhancing tutees' learning, while maintaining tutors' own achievement. Data analysis revealed that enhancing tutees' learning required tutors and tutees each to perform roles that were individually relevant. For example, at a cognitive level, tutees had to think aloud, verbalize what they learn, and pay attention. On a behavioral level, students had for example, to listen, cooperate, and compromise explaining, repeating and providing cues. At the affective level, tutors had to reinforce, praise, and encourage successful responses from the tutees. Koh's (2015) as cited in Nazzal (2010) study revealed that more than half of the respondents perceived small group discussion; case study, student presentation, cooperative learning, PL and role play to be useful active learning strategies for helping students to attain all the higher levels of Benjamin Bloom's taxonomy of cognitive learning outcomes.

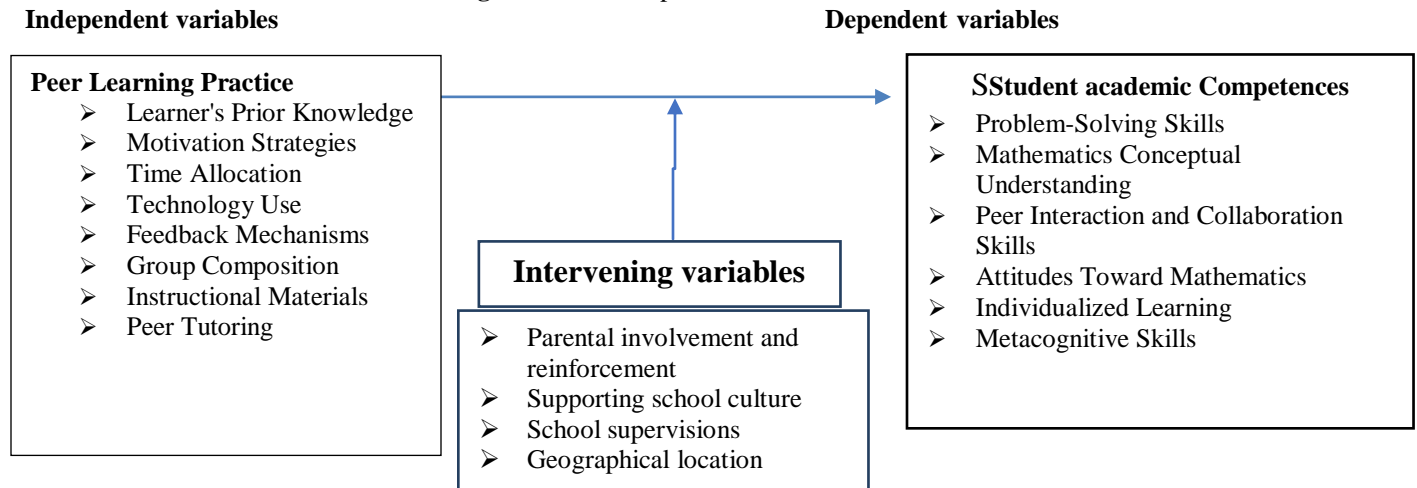
Nazzal (2010) recommended the use of peer learning as an alternative means of lessening the potential effects of several factors that put low socio-economic students at risk for dropping out of school. Peer learning reinforced

perceptions of students towards the school and decreased feelings of alienation. A study conducted by Uloko, (2014) revealed that achievement difference as found in this study between the experimental and control groups of the learning-challenged students in statistics and the difference in the achievement of male and female learning-challenged students in statistics which was also found not significant in this study all depend on the strategy of teaching.

Conceptual Framework

The diagram below shows the relationship indicators of independent variables and dependent variables. The researcher outlined the key indicators of the independent variable Sitko (2013), The study's conceptual framework is based on the model shown in diagram 1

Figure 2.1:- Conceptual framework.



Source: Researcher (Developed 2023)

Figure 2.1 is a Conceptual framework of this study. Learner's Prior Knowledge, Time Allocation, Technology Use, Feedback Mechanisms, Group Composition, Instructional Materials, Peer Tutoring are indicator independent variable whereas, Mathematics Achievement, Problem-Solving Skills, Mathematics Conceptual Understanding, Peer Interaction and Collaboration Skills, Attitudes Toward Mathematics, Individualized Learning and Metacognitive Skills are indicator of dependent variable.

The figure 2.1 also pictured the relationship in the three objectives of the study. It is conceptualized that the independent variables will work to improve/ make better or decrease /worsen student academic performance. Furthermore, it showed that peer-learning practices can influence students' academic competences.

The interaction between peer learning approaches and various factors significantly influences students' academic competences in mathematics. Firstly, learners' prior knowledge plays a pivotal role as peers scaffold each other's learning based on individual strengths and weaknesses. Motivation strategies embedded within peer learning activities foster intrinsic motivation, encouraging active engagement in problem-solving tasks and collaborative projects. Time allocation ensures meaningful interactions, allowing students to engage deeply with peers and consolidate their understanding. Technology integration enhances learning experiences by providing additional resources and facilitating communication among peers, ultimately enhancing problem-solving skills and conceptual understanding.

Furthermore, peer feedback mechanisms enable students to provide and receive constructive feedback, promoting reflective learning and continuous improvement. Group composition influences peer interaction and collaboration skills, fostering inclusive learning environments and impacting attitudes toward mathematics. Well-designed instructional materials support peer learning by providing clear explanations and guided practice. Peer tutoring, a core component of peer learning, reinforces learning through teaching, contributing to the development of problem-solving skills, conceptual understanding, and metacognitive awareness. These interactions underscore the dynamic nature of peer learning in shaping students' academic competences in mathematics.

Research Methods and Methodology:-

Target Population

A study population was defined as the entire group of individuals, events, or objects having common characteristics in which a study was interested (Mugenda&Mugenda, 2013). Kothari (2014) defined a population as the universe of the study through which the research intended to draw a sample for administering primary data collection tools.

The target population for this study was consisted of 5sector Education officers, 20 secondary school Head teachers, 40 Mathematics teachers and 1435 students of the 20 secondary schools and totaling 1500 participants in Ruhango District

Sample Size

Denscombe, (2018) asserts that the sample must be carefully selected to be representative of the entire population and to provide information that can scientifically be tested. Random sampling technique will be used to select a representative sample from each of the parties that was used in the study. This research was composed of 1500 people as the study population whereby sample size was found by using the SLOVIN's formula (Tejada et al., 2012) where n stands for the sample size, N stands for the population size while e stands for the margin of error (0.05) as follows: $n = \frac{N}{1+N(e)^2}$ Therefore, $n = \frac{1500}{1+1500(0.05)^2} = 315$

N: Total population under the study will be 1500 and n: sample is 315

Data Collection Methods:-

The researcher used a combined method consisting of a descriptive survey and interviews. The descriptive survey was selected due to the limited time available for the research project, which made it challenging to deal with a large number of schools, teachers, and students from all public secondary schools and educational institutions in the district under study. The respondents under investigation were geographically dispersed in the area under study, which influenced the choice of the descriptive survey method.

Interviews were also used to gather information from head teachers because their number was limited. The decision to employ mixed methods was influenced by the researcher's financial resources, as it allowed them to reach every respondent in the target population and spend time with them during the investigation. Questionnaires were administered to the sampled teachers and students.

Data Collection Instruments

To obtain qualitative primary data, a structured questionnaire was developed, which included both open-ended and closed-ended questions related to the purpose and objectives of the study. The researcher to address the research questions also conducted interviews. A carefully designed questionnaire, along with a written interview guide, was used to facilitate a comparison between written and oral responses from key informants, including students, head teachers, Sector Education officers, and teachers. The interview schedules were semi-structured personal interviews, allowing the researcher to engage with the respondents and gather information that is more detailed from them. Interviews were chosen because they facilitated the generation of detailed qualitative data and provided immediate feedback from the respondents when collecting in-depth information related to the study's themes. Additionally, interviews were helpful in cross-checking responses provided in the questionnaires to ensure consistency and validity of the responses, thus supporting data triangulation.

Findings and Discussions:-

Considering the research objectives, the presentation of findings was done due to specific research objectives of this study such as To what extent do peer-learning practices influence students' academic competences in mathematics in Ruhango District, Rwanda, What are the students' academic competences in mathematics due to peer learning practices in public secondary schools in Ruhango District, Rwanda, What is the relationship between peer learning practices and academic competences in mathematics among students in public secondary schools in Ruhango District, Rwanda.

Table 1:- Correlation Analysis of Peer-Learning's Practices Impact on Students' Math Competences in Ruhango District.

Model		participate in peer learning practices	engaging in peer learning activities	changes or improvements	continue participating	challenges or difficulties
participate in peer learning practices	Pearson Correlation	--				
	N	302				
engaging in peer learning activities	Pearson Correlation	.163	--			
	Sig. (2-tailed)	.005				
	N	302	302			
changes or improvements in your academic competences	Pearson Correlation	.830	.199	--		
	Sig. (2-tailed)	<.001	<.001			
	N	302	302	302		
continue participating	Pearson Correlation	.674	.189	.682	--	
	Sig. (2-tailed)	<.001	<.001	<.001		
	N	302	302	302	302	
challenges or difficulties	Pearson Correlation	.128	.850	.169	.161	--
	Sig. (2-tailed)	.027	<.001	.003	.005	
	N	302	302	302	302	302

Source: Field data(2023).

The study identify how the peer-learning practices influence students' academic competences in basing on independent variable. The results in the table 1, reveal that there is a significance high degree of positive correlation between peer learning practices and students' academic competences A strong engaging in peer learning practices to participation in peer learning during mathematics class was at high degree of positive correlation where Pearson coefficient of correlation states the correlation ($r=0.163$, $p\text{-value}=0.005$), changes or improvements in academic competences as result of peer learning practices during mathematics class was shown at high degree of positive correlation where Pearson coefficient of correlation states the correlation (0.830 , $p\text{-value}<0.001$), willing of students to continue participating in peer learning practice the correlation (0.674 , $p\text{-value}<0.001$). This means that peer learning practice influence students' academic competences in mathematics.

Results on how the peer learning practices in Mathematics influence students' academic competences in public secondary schools of Ruhango district in Rwanda indicates 94.5% of students agreed that there are changes or improvements in your academic competences in mathematics as a result of participating in peer learning practices in their school class peer learning is the teaching and learning methods used in Mathematics subject in Ruhango District at mean response of 4.40 with a standard deviation equal to 0.69, 86.9% of participants agreed that there were no academic competences in mathematics before engaging in peer learning activities, Moreover, the findings highlight that a vast majority of participants, 94.4%, actively engage in peer learning practices during mathematics classes in Ruhango District schools, emphasizing the widespread adoption of these methods. The strong consensus of 93.8% among respondents in favor of continuing their participation in peer learning practices in mathematics classes indicates not only their efficacy but also their sustainability as a preferred teaching and learning approach. Lastly,

the data also suggests that most students, 87.5%, do not encounter significant challenges or difficulties when collaborating with their peers on mathematics assignments or projects, further supporting the feasibility and positive impact of peer learning practices in this educational context. These results collectively demonstrate the substantial role of peer learning in enhancing students' academic competences in mathematics within the public secondary schools of Ruhango District, thereby emphasizing its potential as a beneficial educational strategy.

Table 2:- Correlation Analysis on Students Academic Competences Due to Peer Learning Practices.

		Peer learning has significantly contributed	Peer learning has improved my understanding Mathematics	Peer learning has impacted my Math's' grades.	Peer learning has enhanced my problem-solving skills.	I feel confident in my academic abilities due to peer learning.	Peer learning has significantly improved.
Peer learning has significantly contributed to my academic competence	Pearson Correlation	--					
	N	302					
Peer learning has improved my understanding of Mathematics.	Pearson Correlation	.705**	--				
	Sig. (2-tailed)	<.001					
	N	302	302				
Peer learning has impacted my Math's grades.	Pearson Correlation	.922**	.771**	--			
	Sig. (2-tailed)	<.001	<.001				
	N	302	302	302			
Peer learning has enhanced my problem-solving skills.	Pearson Correlation	.639**	.696**	.627**	--		
	Sig. (2-tailed)	<.001	<.001	<.001			
	N	302	302	302	302		
I feel confident in my academic abilities due to peer learning.	Pearson Correlation	.967**	.719**	.934**	.664**	--	
	Sig. (2-tailed)	<.001	<.001	<.001	<.001		
	N	302	302	302	302	302	
Peer learning has significantly improved my overall academic competence.	Pearson Correlation	.705**	1.000**	.771**	.696**	.719**	--
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	
	N	302	302	302	302	302	302

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

Source: Field data(2023).

This study was to identify the students' academic competences that is due to peer learning practices basing on the independent variable. Results to the second objective concerning academic competences of students in mathematics that is due to peer learning practices in Public secondary schools such that 93.1% of students agreed that they get good Math's grades during Mathematics test at 4.36 of mean, 91.5% of students agreed that peer learning practices Enhanced their problem-solving skills at 4.30 of mean, 94.5% of students agreed that they improved their Mathematics Conceptual Understanding at 4.40 of mean, 92% of students agreed that they Increased their peer Interaction and Collaboration Skills at 4.33 of mean, 94.5% of students agreed that they Enhanced my

Metacognitive Skills at 4.40 of mean, while 92.5% of students agreed that they Confident in their academic abilities at 4.34 of mean.

The comparative interpretation of views from various respondents concerning the influence of peer learning practices on students' academic competences in mathematics in public secondary schools points to a clear and consistent pattern. The data indicates that there is a strong positive consensus among respondents regarding the positive impact of peer learning practices. An overwhelming majority of students perceive that their academic competences in mathematics have significantly improved as a result of participating in these practices. This alignment is robust across various aspects, including improved grades, problem-solving skills, conceptual understanding, interaction and collaboration skills, metacognitive abilities, and academic confidence. The high agreement percentages and strong correlations in the data collectively support the conclusion that academic competences in mathematics are indeed notably high in public secondary schools, largely attributable to the efficacy of peer learning practices. These findings highlight the pivotal role of collaborative learning strategies in enhancing the academic competences of students, offering valuable insights for educators and policymakers aiming to further improve the quality of education in public secondary schools.

These competences are not only important for success in formal education but also in various aspects of life and future career opportunities. They are developed over time through a combination of formal education, experiential learning, and personal growth (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Schools and educational institutions play a significant role in fostering and assessing these competences in students.

Table 3:- Correlation Analysis on Relationship Between Peer Learning Practices and Students Academic Competences.

Model		participate in peer learning practices	Peer learning has significantly contributed to my academic competence	Peer learning has enhanced my problem-solving skills.	Peer learning has significantly improved my overall academic competence.
participate in peer learning practices	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	302			
Peer learning has significantly contributed to my academic competence	Pearson Correlation	.860**	1		
	Sig. (2-tailed)	<.001			
	N	302	302		
Peer learning has enhanced my problem-solving skills.	Pearson Correlation	.608**	.639**	1	
	Sig. (2-tailed)	<.001	<.001		
	N	302	302	302	
Peer learning has significantly improved my overall academic competence.	Pearson Correlation	.830**	.705**	.696**	1
	Sig. (2-tailed)	<.001	<.001	<.001	
	N	302	302	302	302

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

Source: Field data (2023).

Results to the third objective related to the relationship between peer learning practice and academic competences in mathematics in public secondary school where 93.1 % of students agreed that peer learning practices impacted their mathematics grades; 91.5% of respondents agreed that peer learning practices enhanced their problem solving skills; 94.5% respondents agreed peer learning practices improved their mathematic Conceptual Understanding; 92% of

respondents agreed that peer learning practices Increase their peer Interaction and Collaboration Skills and 94.5% of students also agreed that peer learning practices Enhanced my Metacognitive Skills.

A strong relationship was established between students' academic competences and peer learning practices where Pearson coefficient of correlation states the correlation ($r=0.860$, $p\text{-value}<0.001$), Peer learning practices and students problem solving skills (0.608^{**} , $p\text{-value}<0.001$), Students academic abilities and peer learning practices ($r=.876^{**}$, $p\text{-value}<0.001$). changes or improvements in your academic competences due to peer learning practices ($r=.705^{**}$, $p\text{-value}<0.001$) The association is related because $p\text{-value}$ was less than 0.05, explaining that peer learning practices influence students' academic competences at high level.

It is important to note that the effectiveness of peer learning practices in improving academic competences in mathematics can vary based on the specific context and how well these practices are implemented. Effective facilitation, clear learning objectives, and the creation of a supportive peer learning culture are all essential for realizing these benefits (Johnson, Johnson, & Smith, 2014). Additionally, not all students may benefit equally from peer learning, as individual learning preferences and personalities can play a role.

Conclusions and Suggestions for Further Study:-

The first research question of this research that was presented was "To what extent do peer-learning practices influence students' academic competences in mathematics in Ruhango District, Rwandam In conclusion, the findings of this study reveal a substantial positive correlation between peer-learning practices and students' academic competences in mathematics in Ruhango District, Rwanda. The evidence points to significant improvements in problem-solving skills, enhanced peer interaction and collaboration abilities, and increased student engagement as a direct result of active participation in peer-learning practices. These outcomes underscore the potential of peer learning as an effective pedagogical approach to enriching students' academic competences in mathematics. The study suggests that integrating peer learning into mathematics classrooms can provide a fertile ground for nurturing these essential skills, ultimately benefiting the educational landscape in Ruhango District and potentially serving as a model for similar contexts seeking to enhance students' academic competences.

The conclusion was also drawn basing on the second research question of this study which was "What are the students' academic competences in mathematics due to peer learning practices in public secondary schools in Ruhango District, Rwanda In summary, the second research question in this study has shed light on the nature of students' academic competences in mathematics resulting from peer learning practices within public secondary schools in Ruhango District, Rwanda. The evidence from the respondents strongly indicates that peer learning practices, when effectively implemented, have a substantial impact on these competences. Specifically, students demonstrated improved conceptual understanding of mathematical concepts, increased active participation in classroom activities, and enhanced metacognitive skills as a direct consequence of engaging in peer learning practices. This not only underscores the significance of peer learning as an instructional strategy but also emphasizes the potential for optimizing mathematical education in the context of public secondary schools in Ruhango District, Rwanda. These findings hold promise for educational stakeholders and policy-makers seeking to enhance academic competences among students in the region.

Basing on the third research question of this study which was "What is the relationship between peer learning practices and academic competences in mathematics among students in public secondary schools in Ruhango District, Rwanda? The results clearly indicate that there is a strong and positive association between these variables, with a notable percentage of the variance in academic competences being explained by peer learning practices, ranging from 85% to 95.8%. Moreover, the correlation matrix between the independent variables has shown consistent and statistically significant positive relationships, as reflected in the $p\text{-values}$ being less than 0.05. This underlines the pivotal role of peer learning practices in influencing and enhancing students' academic competences in mathematics within the context of public secondary schools in Ruhango District, Rwanda. These findings offer important implications for educational strategies and policies aimed at optimizing student learning outcomes and promoting effective peer learning practices in the region.

In summary, the findings of this study underscore the significant and positive impact of peer-learning practices on students' academic competences in mathematics in Ruhango District, Rwanda. The investigation, guided by three key research questions, reveals compelling evidence supporting the effectiveness of peer learning. First, peer-learning practices contribute to enhanced problem-solving skills, improved peer interaction and collaboration, and

increased student engagement. These competences are vital for students' success not only in mathematics but also in broader educational contexts. Second, the study highlights that when implemented effectively, peer-learning practices result in improved mathematics conceptual understanding, increased student participation, and heightened metacognitive skills. This affirms the potential for peer learning to enrich the quality of mathematical education in public secondary schools in the district. Third, the research demonstrates a strong and positive relationship between peer learning practices and academic competences, with the variance explained ranging from 85% to 95.8%. The correlation matrix further supports these conclusions. These findings have significant implications for educational strategies and policies, emphasizing the value of peer learning in optimizing students' academic competences and fostering enriched learning experiences in the region.

Suggestion for Further Studies:-

This study was done in public secondary schools located in Ruhanga district and it was based on influence of peer learning practices on the students' academic competences in mathematics in secondary school in Rwanda.

1. The researcher suggests that further research can be done to identify the influence of students' academic competences on the students' academic performance in public secondary schools in Rwanda to come up with comparative analysis.
2. This study limited itself in Ruhango district in Rwanda, a national wide study should be carried out to investigate influence of peer learning practices on the students' academic competences in mathematics in secondary school in Rwanda.

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