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## Effect of Discussion Method on the Performance of Mathematics Students in Public Secondary Schools in Rwanda: A Case of Karongi District

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## Effect of Discussion Method on the Performance of Mathematics Students in Public Secondary Schools in Rwanda: A Case of Karongi District

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### Abstract

**Purpose:** In class discussion method can be used while studying Mathematics as it is intended to be a free give and take between teacher and students and among students on the current topic of concern in the course. It is characterized by probing questions from the teacher designed to elicit student interpretations, opinions, and questions. The purpose of study is to assess the effect of group discussion method on the performance of Mathematics students in public day Schools in Rwanda” A case of Karongi District’.

**Materials and Methods:** The study used descriptive research design. Stratified sampling was used to determine a sample of 6 schools among other public secondary schools in Bwishyura sector in Karongi District. The head teachers of the sampled schools were purposively selected to participate in the study. Simple random sampling technique was further applied to obtain Mathematics teachers and students of senior 4,5 and 6, making 783 target students. The study used a sample of 230 respondents from the sampled schools. The collected data was analyzed using descriptive statistics, correlation, and regression analysis through the statistical package for social science (SPSS) version 21. The data collected were analyzed using multiple linear regression analysis. The probability value of the

regression estimate was used in testing the hypotheses of the study.

**Findings:** The result of the regression analysis indicates that Demonstration Method has a positive effect on Performance of Mathematics students in public secondary Schools in Karongi District and the relationship is statistically significant ( $p > 0.05$ ). Results showed significant positive relationship between discussion method and the performance of Mathematics students ( $r = 0.860$ ;  $p = 0.000$ ). Multiple linear regression analysis showed that discussion method contributed to 72% of variation on the performance, hence plays a vital role in performance of Mathematics students in public secondary schools in Karongi District.

**Implications to Theory, Practice and Policy:** The study recommended that Mathematics teachers should be trained and encouraged in the use of discussion teaching method and the framework for planning lessons and teaching mathematics in our secondary schools should be on group discussion teaching strategy. Moreover, it was also useful to enable learners to take part in discussion, reflection, feedback and to consolidate learning, clarify understanding and explore ideas and concepts.

**Keywords:** *Discussion Group Method, Performance, Mathematics, And Students*

## 1.0 INTRODUCTION

Globally, since the twentieth Century, countries in various parts of the world introduced student centred Learning (SCL) methods to tackle the issue of teacher centred methods (TCM) in teaching and Learning So as to improve the students' academic performance (Lall, 2018). The literature shows that, the application of SCL methods in teaching Mathematics had been reached by 1980s in some parts of the world (Lambros, 2012). Nonetheless, it was not clear on the extent of implementation of the SCL methods So long as the students' performance in Mathematics was continuously poor.

Teaching mathematics in today's world requires practices and procedures integrated with performance tasks that actively involve students. More pupils in secondary schools are still finding it difficult to see mathematics as an easy subject, contrary to what some mathematicians say. In their desire to study science-related subjects and take after their doctor and engineer idols, they have often been discouraged by their inability to understand the intricacies of calculation (Ojeme , 2017)

To solve mathematical and non-mathematical problems, which include the ability to reason, to explain and justify ideas, to use resources to find needed information, to work with other people on a problem, and to generalize to different situations, as well as the traditional ability to carry out computations and procedures. Zemelman, Daniels, and Hyde (1998) describe the math teacher's goal as "helping] all students develop mathematical power." This mathematical power allows a student to feel mathematics is personally useful and meaningful, and to feel confident that he or she can understand and apply mathematics.

Hyman (2010) highlighted that discussion is used to arrive at the solution of problems and is characteristics of democratic societies. It occurs in a group form and usually involves six to ten persons. These persons perform one of two roles: leader-moderator who is typically the teacher, and participant: typically, the students. Participants use the time to communicate with each other. Another student follows the group leader addresses his/ her remark to the whole group and each group member has the right to speak. A group member communicates with other members in the group by speech, and by facial expressions, gestures and body movement. Other members receive his / her message by listening and by seeing the non-verbal signs. These processes of listening, speaking, and observing are the bases of discussion method (Vedanayagam, 2014).

The teacher must keep a balance between controlling the group and letting its members speak. The goal of a discussion is to get students to talk purposefully about the course material. Teacher's role becomes that of facilitator. He/she moderates the discussion rather than convey information. For a purposeful discussion, teacher should not do all the talking; or talk to one student at a time. It should be remembered that the discussion is not just a matter of teacher's communication with students; it is a chance for them to share ideas Individual style will influence the amount of control a teacher will use, but in general the teacher's role in a discussion is not to dominate, but rather to get the discussion started, set goals, summarize, mediate, clarify, and allow all to be heard (Real, 2014).

In developed countries, Over the past decades, mathematics instruction has undergone a "reform" movement that emphasizes critical thinking, communication, and collaborative learning over rote memorization or application of formulas, procedures, and basic skills. Analogously, a new set of

teaching methods focusing on these goals has been labeled "effective mathematics instruction (Zemelman, 2018). The teaching methods and strategies that constitute effective teaching of mathematics depend on one's definition of "mathematics." If school mathematics is merely a collection of formulas, rules, and procedures that must be memorized and mastered, then many traditional teaching techniques like drilling, individual worksheet practice, and flashcards could be considered effective. However, the current definition emphasizes that mathematics is an integrated whole, a study of structures and the relationships between things, and a way to study and understand the world around us. The goal of teaching. Mathematics is changing too. Now teachers need to help students develop the skills they will use every day.

In Sub Saharan Africa (SSA), Mathematics has been portrayed as a complex subject by most of the learners especially where standards have been extremely low. Bethell (2016) observed that it would take several years for SSA countries to reach the levels comparable to their counterparts of the high-flying income economies of East Asia if the problem of low achievement in mathematics is not addressed accordingly and urgently. One of the efforts aimed at realising such expectations in Rwanda (Rwanda Education Board, 2015) includes that of reviewing the curriculum to align it with national aspirations and to ensure that the knowledge, skills, attitudes, and values acquired by learners are consistent with the requirements of the 21st century skills. It is also believed that equipping learners with necessary skills could lead to the development of a knowledge-based economy that can propel individual citizens to compete in the global market

### **Statement of the Problem**

Mathematics is a very important' subject that is needed in everyday life however; most learners see it as a difficult subject which is sometimes hindered by other factors like lack of teaching materials and trained teachers. For learners to perform well they need to be taught using methods that help them understand the subject. However, the factors mentioned above hinder the effective teaching of mathematics and hence need for the study.

This study sought to achieve the following research hypothesis:

**H<sub>01</sub>:** There is no significant effect between group discussion method and performance of Mathematics students in public secondary Schools in Karongi District.

## **2.0 LITERATURE REVIEW**

### **Discussion Method in Teaching Mathematics**

The effectiveness of classroom discussion in a math classroom is a very important topic to know because many math teachers tend to shy away from listening to what their students have to say. For many, it is easier to talk all period and teach them the teacher's way of doing things. Their work is then easier to grade because they all use the same method-- the teacher's method. If a teacher were to open up their classroom to some discussion, then they would have to learn other methods and challenge their own thinking.

Not only is classroom discussion important because it offers a platform for math students to share their ideas, but it is critical for understanding as the students work through their thought processes. When the teacher is talking the whole class period and students offer short answers here and there then the students are lacking the time to actually think through the problem and make their own

mistakes. Instead, the teacher is up at the white board guiding them through the problem. In this case, the teacher is not letting them correct themselves or even think for themselves.

The discussion teaching strategy involves the small group activities to discuss and to find the solution of the problem (Wang, 2016). The discussion teaching method is also called constructive learning process. The discussion teaching method is a two-way conversation method. It is an active learning strategy (Shamsudin et al., 2017)

In a group discussion, the teacher and all of the students work on specific content together, using one another's ideas as resources. The purposes of a discussion are to build collective knowledge and capability in relation to specific instructional goals and to allow students to practice listening, speaking, and interpreting. The teacher and a wide range of students contribute orally, listen actively, and respond to and learn from others' contributions.

In a group discussion about mathematics, the teacher supports students to individually and collectively engage in sense-making about rich mathematical content. A mathematics discussion can provide opportunities for students to learn, practice, and refine habits of mind and discourse relevant to the field of mathematics (Kane, 2013).

Springer and Dick (2006) describe the teacher as having many roles in the classroom. A teacher may have the idea that students need to "discover" things for themselves. It becomes a classroom management nightmare when it is left up to the class. It really does make a difference that the teacher has a significant role in the classroom. Springer and Dick describe the roles of the teacher as choreographer, stage manager, director, and dancer. Koenig (2001) discusses how teachers engage students in mathematical thinking and why it is important. She emphasizes key points such as leading questions, summarizing, and paraphrasing in classroom discussion. Koenig says it is clearly not enough for the teacher to stay out of the way. One may think teachers often get into thinking they need to let the students do it without them when, in fact, they need to be a big part of the discussion.

### **Theoretical Framework**

This point is made of two theories that are supposed to be very important in explaining this study area. These is theories are constructivism and humanism theories.

#### **Constructivism Theory**

Constructivism is the idea that people are responsible in creating their own understanding of the world and using what they know based on previous experiences in the process of linking new information to these experiences. People use these experiences and new information to construct their own meaning. Constructivism as a paradigm or worldview posits that learning is an active, constructive process. The learner is an information constructor. People actively construct or create their own subjective representations of objective reality. New information is linked to prior knowledge; thus mental representations are subjective

A reaction to didactic approaches such as behaviorism and programmed instruction, constructivism states that learning is an active, contextualized process of constructing knowledge rather than acquiring it. Knowledge is constructed based on personal experiences and hypotheses of the environment. Learners continuously test these hypotheses through social negotiation. Each person has a different interpretation and construction of knowledge process. The learner is not a blank slate (tabula rasa) but brings past experiences and cultural factors to a situation.

A common misunderstanding regarding constructivism is that instructors should never tell students anything directly but, instead, should always allow them to construct knowledge for themselves. This is actually confusing a theory of pedagogy (teaching) with a theory of knowing. Constructivism assumes that all knowledge is constructed from the learner's previous knowledge, regardless of how one is taught. Thus, even listening to a lecture involves active attempts to construct new knowledge. Vygotsky's social development theory is one of the foundations for constructivism.

This theory is relevant because using discussion method in learning mathematics, the student draws on prior knowledge and understanding to create a new understanding. According to Simply (2018) Psychology, constructivism holds that learners can only create meaning by active interaction with the outside world (including conducting experiments or addressing real-world problems). This is in contrast to the passive perspective of education, which sees the learner as a blank slate to be filled with knowledge.

### **Theory of Performance**

The Theory of Performance (ToP) develops and relates six foundational concepts to form a framework that can be used to explain performance as well as performance improvements. To perform is to produce valued results. A performer can be an individual or a group of people engaging in a collaborative effort. Developing performance is a journey, and level of performance describes location in the journey. Current level of performance depends holistically on 6 components: context, level of knowledge, levels of skills, level of identity, personal factors, and fixed factors. Three axioms are proposed for effective performance improvements.

These involve a performer's mindset, immersion in an enriching environment, and engagement in reflective practice. Humans are capable of extraordinary accomplishments. Wonderful accomplishments also occur in day-to-day practice in higher education. An advisor inspires students to follow their dreams. A teacher magically connects with students. A researcher continually asks the quintessential questions that lead to revolutions in thinking. A Dean inspires an entire college to collaborate and attain wonderful outcomes. Since worthy accomplishments are produced from high level performances, a theory of performance (ToP) is useful in many learning contexts. Performance, as the adage goes, is a "journey not a destination." The location in the journey is labeled as "level of performance."

Each level characterizes the effectiveness or quality of a performance. As a lawyer improves her level of performance, she can conduct legal research faster, more thoroughly, and more in-depth. As an academic department improves its level of performance, the members of the department are able to produce more effective student learning, more effective research, and a more effective culture. As a manager advances his level of performances, he is able to organize people and resources more effectively and to get higher quality results in a shorter time. As a teacher advances his levels of performance, he is able to produce deeper levels of learning, improved levels of skill development, and more connection with the discipline for larger classes while spending less time doing this. As an actor improves his level of performance, he is able to learn parts quicker, play more varied roles, and produce a deeper and more meaningful impact on audiences.

### 3.0 MATERIALS AND METHODS

This study evaluated the effect of teaching methods on student's performance in mathematics in public secondary schools of Karongi in Rwanda. For this study, the population was formed by public secondary school teachers from 6 public secondary schools offering general education in Karongi District of Rwanda. The study targeted those six schools because they are more affected with a big percentage of enrollment rate of students. Thus, the study targeted students, deans of studies, head teachers and teachers from those six selected schools. Besides, the research targeted secondary school Mathematics teachers since the study was to assess the effect of teaching methods on performance of Mathematics in public secondary schools in Karongi District. Science/Mathematics students of senior 4,5 and 6 was targeted because they have better knowledge and experience about their schools' teaching and learning methods compared to other students in their respective schools

**Table 1: Table Showing Size of Population of Selected Schools**

Schools	Number of Teachers	Number of Dean of Studies	Number of Head Teacher	Number of Students	Total Population
ES Bwishyura	4	1	1	138	144
GS Nyegabo	3	1	1	121	126
GS Kibuye	5	1	1	98	105
GS Nyamarebe	6	1	1	162	170
GS Nyabikenke	2	1	1	139	142
GS Rurangwe	2	1	1	125	129
<b>Total</b>	<b>22</b>	<b>6</b>	<b>6</b>	<b>783</b>	<b>817</b>

*Source: Karongi District Report, 2022*

In this study, stratified, purposive sampling and simple random sampling techniques was used. Stratified sampling was used to determine a sample of 6 schools among other public secondary schools. It was done to make sure all schools in the district was represented in the study. Schools was stratified or grouped then one school will be selected randomly. The head teachers of the sampled schools were purposively selected to participate in the study. Simple random sampling technique was further applied to obtain Mathematics teachers and students of senior 4,5 and 6, making 783 students from the sampled school.

In addition, the study used the following formula proposed by using Yamane (1973) to determine the sample size because that is too large waste scarce resources and could expose more participants than necessary to any related risk. Thus, the study used Yamane formula to calculate a sample size because it is the most appropriate for this study.

Using Yamane formulae

$$n = \frac{N}{1 + (N)(e^2)}$$

Where:

n = sample size

$N$  = the population size

$e$  = the acceptable sampling error (5%) at 95% confidence level

Thus;  $n = 817 / (1 + 817) (0.05)^2$

$$n = 272.3 = 272 \text{ respondents}$$

A sample of 272 respondents was targeted to participate in this study. This formula was used to estimate a representative sample. A total number of 272 respondents was taken as simple size. The following is the table showing sample size for each category of five selected schools:

**Table 2: Table Representing a Sample Size**

Schools	Number of Teachers (Mathematics)	Number of Dean of Studies	Number of Head Teacher	Number of Students	Sample Size
ES Bwishyura	2	1	1	44	48
GS Nyegabo	1	1	1	40	43
GS Kibuye	2	1	1	30	34
GS Nyamarebe	3	1	1	53	58
GS Nyabikenke	1	1	1	44	47
GS Rurangwe	1	1	1	39	42
<b>Total</b>	<b>10</b>	<b>6</b>	<b>6</b>	<b>250</b>	<b>272</b>

Source: Researcher, 2023

In this study the researcher used interviews, questionnaires, and documentary review. Closed – ended questions were used where the answers were divided into categories such discrete, distinct and relatively few in number. It is easier for respondents to answer because they had only to choose categories. In that way a chance for irrelevant answers is limited to the minimum, because appropriate answer categories were provided. The main respondents were being teachers that was given the questionnaire as they were enough time to respond to the questions based on specific objectives. Questionnaires were given to Mathematics teachers, dean of studies and students from senior 4, 5 and 6.

The study involved oral questions based on the use of interview guides. This was a flexible way, because questions were both open and closed ended. This method helped the interviewer to collect supplementary information about the respondents as well as the researcher probed for more specific answers while at the same time helping the researcher to repeat a question when the response indicated that the respondent misunderstands the question

Interview guides were used to head teachers. The respondents were requested to answer questions, and the researcher used semi-structure interview questions which enabled the researcher to ask broad questions in any order considered appropriate. Also, questions gave the respondents room to answer freely and amplify the responses. The respondents were interviewed at their perspective school.



## 4.0 FINDINGS AND DISCUSSION

### Findings

In this study the research sampled Mathematics teachers, headteachers, and science/Mathematics students of senior 4,5 and 6 because they have better knowledge and experience about their schools' teaching and learning practices compared to other students in their respective schools. Table 3 shows the return rate of respondents.

**Table 3: Response Rate**

Respondents	Targeted	Obtained	Response Rate(%)
Head teachers	6	6	100
Teachers of Mathematics	16	12	75
Students	250	212	84.4
<b>Total</b>	<b>272</b>	<b>230</b>	<b>84.5</b>

Source: Primary Data, 2023

As shown in Table 3, from the targeted respondents, four questionnaires from teachers and 38 questionnaires from students were not returned, so the participation rate was reduced to 12 (75%) of the teachers and 212 (84.4%) of the students. Regarding headteachers, the study sampled 6 school headteachers from 6 secondary schools and 6 of them interviewed; therefore, the response rate was 100%. Overall, the response rate of respondents was 84.5%.

### Descriptive Statistics

#### Effect of Discussion Method on the Performance of Mathematics Students in Public Secondary Schools in Karongi District

In this research the study attempted to determine the effect of discussion method on academic performance of mathematics subject in public day schools in Karongi District in Rwanda.

**Table 3: Level of Agreement on How Discussion Method and Performance of Mathematics Students**

Statements	Mean	Std Dev
In a group discussion, the teacher and all of the students work on specific content together, using one another's ideas as resources	3.8	.79
It builds collective knowledge and capability in relation to specific instructional goals and to allow students to practice listening, speaking, and interpreting.	3.9	.82
The teacher and a wide range of students contribute orally, listen actively, and respond to and learn from others' contributions	3.5	.74
Teacher supports students to individually and collectively engage in sense-making about rich mathematical content	4.2	.69
Discussion method can provide opportunities for students to learn, practice, and refine habits of mind and discourse relevant to the field of mathematics.	4.7	.99
The method helps students to improve their critical thinking and problem-solving skills	3.5	.67

*D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree, M=Mean, Std=Standard deviation*

As shown in Table 3, the results relate to the six statements assessing the effect of discussion method on the performance of Mathematics students in public secondary schools in Karongi District. The results show that for the first statement, the majority of respondents agreed that in a group discussion, the teacher and all of the students work on specific content together, using one another's ideas as resources while learning Mathematics subject, with a mean value of 3.8, and a high positive correlation standard deviation of 0.79. The second item asked by respondents whether this approach builds collective knowledge and capability in relation to specific instructional goals and to allow students to practice listening, speaking, and interpreting while learning Mathematics. The results showed that the majority of respondents strongly agreed and agreed with this statement ( $M=3.9$ ,  $SD=0.82$ ). For the third statement, the teacher and a wide range of students contribute orally, listen actively, and respond to and learn from others' contributions while learning mathematics subject, the majority of respondents agreed with this statement, with a mean of 3.5 and a very positive and high standard deviation correlation (0.74). The fourth statement asked whether teacher supports students to individually and collectively engage in sense-making about rich mathematical content while learning mathematics. Respondents strongly agreed with this statement, with an average mean of 4.2 and a very strong positive standard correlation of 0.69. The next item was whether discussion method can provide opportunities for students to learn, practice, and refine habits of mind and discourse relevant to the field of mathematics while learning Mathematics, the majority of respondents strongly agreed and agreed with this statement, with a mean of 4.7 and a strong correlation standard deviation of 0.99. The next item was whether The method helps students to improve their critical thinking and problem solving skills. The majority of them agreed that statement with a mean of 4.0 and standard deviation of 0.67. From the results, it implies that the majority of respondents strongly agreed and agreed that all of the above are key elements of discussion method used in their six selected schools and have an effect on students learning outcomes in Mathematics subject

### Correlation Analysis

In this section, Pearson's correlation is employed to examine the relationship between the independent variables (IVs) and the dependent variable (DV). To test the relationship, in this section, the mediator in this study is treated as a dependent variable. Correlation coefficients are able to provide a numerical overview of the direction and strength of the linear relationship between the IVs and DVs. Pearson's correlation coefficients ( $r$ ) range from -1 to +1 for the indication of positive or negative correlation. The findings of the correlations between the independent variables and the dependent variables are summarized and presented in Table 4

**Table 4: Correlation Analysis between Independent and Dependent Variable**

		Discussion Method	Performance of Mathematics Students
Discussion method	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	230	
Performance of Mathematics students	Pearson Correlation	.860**	1
	Sig. (2-tailed)	.000	
	N	230	230

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

According to the findings reported in Table 4, the Pearson correlation analysis showed that discussion method ( $r=0.860$ ,  $p=0.000$ ) is positively and significantly related to performance of Mathematics students in public secondary Schools in Karongi District. The correlation was deemed to be statistically significant since the p-value was less than 5%.

The findings therefore show the correlation analysis showed that there is a positive and statistically significant relationship between discussion method and performance of Mathematics students in the six sampled public day schools in Karongi District.

These findings are supported by Ganyaupfu (2014) who stated that that there is a high positive relationship between student's performance and teaching methods especially discussion and lecture methods. In the same angle, Mbarutse (2022) also observed Mathematics teachers in advanced level secondary schools in Rwanda teach mathematics in different teaching methods including: teachers centered, learner's centered method, discussion, discovery, questions and answers and problem-solving method. Instructional methodology of every teacher should be adaptive according to each unit, available resources, learning environment and strength of the students.

### Multiple Regression

A multiple regression analysis was performed in this section to identify the predictor and its contribution towards the criterion. It aims to determine the prediction of a single dependent variable from a group of independent variables. The multiple regression analysis was performed with all the assumptions complied with. The results of the multiple regression are presented in Table 5 to Table 7.

**Table 5: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.848 <sup>a</sup>	.719	.708	.48113

a. Predictors: (Constant), discussion method

The table 5 above shows the quantity of variance that is explained by the predictor variables. The first statistic, R is the multiple correlation coefficient between all the predictor variables and dependent variable. In is model, the value is .848<sup>a</sup>, which indicates that there is a great deal of variance shared by the independent variables and dependent variables. The next value, R Square, is simply the squared value of R. This is frequently used to describe the goodness of fit or the amount variance of 72% which explained by a given set of predictor variables and its value is 70.8% of the variance in the dependent variable is explained by independent variables in the model.

**Table 6: Significance of Independent Variable**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.982	4	13.996	46.531	.000 <sup>b</sup>
	Residual	29.777	99	.301		
	Total	85.760	103			

a. Dependent Variable: performance of mathematics students

b. Predictors: (Constant), discussion method

The table above indicated standard regression which provides the effect of individual predictor variables. This variable is discussion method. The table 6. shows the output analysis and whether there is a statistically significant difference group mean. As seen, it, the significance value is 0.000<sup>b</sup> and the mean is 0.301 Therefore, there is a statistically significant difference in the mean length of model.

**Table 7: Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-12.368	1.372		-9.014	.000
	Decision method	1.537	.144	.654	10.665	.000

a. Dependent Variable: performance of mathematics students

Information presented in Table 7 evidenced that  $Y = -12.368 + 0.221X_1 + \epsilon$  Where  $y =$  performance of mathematics students. The regression output above shows that decision method variables is statistically equal to 0.000. This shows the regression of independent variables are associated with performance of mathematics students. Multiple analysis regression result above indicates the influence of independent variables based on the regression coefficient. The unstandardized Coefficients is 1.372 when is constant and at the same time the Std. Error is .144 when they are associated with coefficients. The significant predictor out of the independent variables is positively related to the criterion in the regression, as shown in Table 7

## Discussion

From the findings, the study found that discussion method affects performance of Mathematics students, when in a group discussion, the teacher and all of the students work on specific content together, using one another's ideas as resources, it builds collective knowledge and capability in relation to specific instructional goals and to allow students to practice listening, speaking, and interpreting, when the teacher and a wide range of students contribute orally, listen actively, and respond to and learn from others' contributions, when a teacher supports students to individually and collectively engage in sense-making about rich mathematical content. Besides, when discussion method can provide opportunities for students to learn, practice, and refine habits of mind and discourse relevant to the field of mathematics and lastly when the method helps students to improve their critical thinking and problem-solving skills

The interview data gathered the views of the participants on the effect of discussion method on the performance of the students in Mathematics subject in Karongi District.

There were interviewed head teachers, the findings from the interview given to them about discussion method and performance of Mathematics students showed that all respondents unanimously agree that there is a strong correlation between discussion method and the performance of students in the Mathematics subject (see also Table 4).

One of them expressing his views, a headteacher had this to say:

*“When this practice of learning in group discussion is routinely done well, students have repeated opportunities to formulate, revise, and refine mathematical arguments and as a result to come to see themselves as people who are capable of reasoning and making sense of mathematics using what they know to build new understandings “(5<sup>th</sup> November, 2023).*

These findings are relevant with Zeynep (2019) who stated that learning by the way of group work which is one of the integrated approach theories encourages students to discuss, criticise and be more attentive whilst rescuing them from memorising information. The researches and our observations show that students who studies mathematics in group work comprehend problems in a better way, put forward new ideas, are in control of the objectives and learn by applying what they understand instead of memorising mathematics that is mostly alleged formulae and their proofs. Mathematical thinking improves with mathematical activities and mathematics is learned more easily in this way.

## **5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **Conclusion**

Based on the findings of this study, it was concluded that discussion method affects performance of Mathematics students in those six selected schools in Karongi District as this method is very important as this approach can provide opportunities for students to learn, practice, and refine habits of mind and discourse relevant to the field of mathematics and teacher supports students to individually and collectively engage in sense-making about rich mathematical content. Besides, the study also concluded that group discussion is important as it helps the teacher and all of the students work on specific content together, using one another's ideas as resources.

### **Recommendations**

In view of the findings of this study, the following recommendations are made such as Mathematics teachers should be trained and encouraged in the use of discussion teaching method and the framework for planning lessons and teaching mathematics in our secondary schools should be on group discussion teaching strategy. Moreover, it was also useful to enable learners to take part in discussion, reflection, feedback and to consolidate learning, clarify understanding and explore ideas and concepts.

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