JIML Journal of Innovative Mathematics Learning ISSN 2621-4733 (print)
Volume 3, No. 4, December 2020 ISSN 2621-4741 (online)

THE COMPARISON OF MATHEMATICAL COMMUNICATION CAPABILITIES STUDENTS WHO GET THINK TALK WRITE (TTW) LEARNING MODEL AND GROUP INVESTIGATION (GI) LEARNING MODEL

Rita Susanti
IKIP Siliwangi, Jl. Terusan Jend. Sudirman Baros
ritasmat97@gmail.com

Received: Aug 15th, 2020; Accepted: Dec 2nd, 2020

Abstract
This study is a quasi-experimental study that aims to compare the mathematical communication skills between students who get the Think Talk Write (TTW) learning model and the Group Investigation (GI) Learning Model, examine their quality improvement and examine students' attitudes towards Think Talk Write (TTW) learning models.) and Group Investigation (GI) Learning Models. The population in this study were all students of class VIII 1 of Leuwigoong Junior High School, with a sample of two classes, namely: class VIII-E as the experimental first class who received the Think Talk Write (TTW) learning model and class VIII-H as the experimental second class that obtained the Model Group Investigation (GI) Learning. The instrument used was a description of mathematical communication skills and attitude scale. The results of data analysis showed that the mathematical communication skills of students who got the Think Talk Write (TTW) learning model were no better than those who received the Group Investigation (GI) Learning Model. Quality Improvement of mathematical ability of experimental first class students who get the Think Talk Write (TTW) learning model with the moderate category and for the improvement of mathematical communication skills of the experimental second class students who receive the Group Invertigation (GI) learning model with the moderate category, and for student attitudes towards mathematics learning using Think Talk Write (TTW) and Invertigation learning models (GI) both interpret well.

Keywords: Mathematical Communication Skills, Think Talk Write Model, Group Investigation Model

Abstrak
Penelitian ini merupakan penelitian eksperimental semu yang bertujuan untuk membandingkan kemampuan komunikasi matematis antara siswa yang mendapatkan model pembelajaran Think Talk Write (TTW) dan Model Pembelajaran Group Investigation (GI), menguji peningkatan kualitasnya dan menguji sikap siswa terhadap Think. Model pembelajaran Talk Write (TTW).) dan Model Pembelajaran Group Investigation (GI). Populasi dalam penelitian ini adalah seluruh siswa kelas VIII 1 SMP Leuwigoong, dengan sampel dua kelas yaitu: kelas VIII-E sebagai kelas eksperimen yang mendapat model pembelajaran Think Talk Write (TTW) dan kelas VIII. -H sebagai kelas eksperimen II yang memperoleh Pembelajaran Model Group Investigation (GI). Instrumen yang digunakan adalah deskripsi keterampilan komunikasi matematis dan skala sikap. Hasil analisis data menunjukkan bahwa kemampuan komunikasi matematis siswa yang memperoleh model pembelajaran Think Talk Write (TTW) tidak lebih baik dibandingkan yang memperoleh Model Pembelajaran Group Investigation (GI). Peningkatan kualitas kemampuan matematis siswa kelas I eksperimen yang mendapatkan model pembelajaran Think Talk Write (TTW) dengan kategori sedang dan untuk peningkatan kemampuan komunikasi matematis siswa kelas II eksperimen yang mendapatkan model pembelajaran Group Invertigation (GI) dengan pada kategori sedang, dan untuk sikap siswa terhadap pembelajaran matematika menggunakan model pembelajaran Think Talk Write (TTW) dan Invertigation (GI) keduanya mengartikan dengan baik.

Kata Kunci: Kemampuan Komunikasi Matematis, Model Think Talk Write, Model Group Investigation

How to Cite: Susanti, R. (2020). The Comparison of Mathematical Communication Capabilities Students Who Get Think Talk Write (TTW) Learning Model and Group Investigation (GI) Learning Model. *JIML*, 3 (4), 227-238.

INTRODUCTION

Mathematical communication skills are very important and need to be improved in mathematics learning. According to [3], communication can help students learn about mathematical concepts when they portray situations, draw, use objects, provide reports and verbal explanations. Another advantage is that it can remind students that they share responsibility with the teacher for the learning that appears in certain learning.

The results showed that the mathematical communication skills of Indonesian students were still not good, according to [4], found the fact that in several different regions of Indonesia, most students had difficulty in solving problems solving problems and translating everyday life questions into models mathematics. This shows that students' communication and mathematical problem solving skills are still not good. Likewise, according to [2], there is a picture of students' weak communication skills due to mathematics learning so far is still not giving enough attention to the development of this ability.

[5],states that "Aspects of communication and reasoning should be important aspects of mathematics learning. Communication aspects train students to be able to communicate their ideas, both oral communication and written communication ". There are various learning models that can be applied to attract students 'attention so that they can maximize and apply students' mathematical communication skills. An effective model that attracts students' attention is Think Talk Write and Group Investigation.

In this study, the author will use the Think Talk Write and Group Investigation learning models to determine mathematical communication skills which use a learning model which is more applicable to junior secondary students. The title of this study is "Differences in Mathematical Communication Capabilities of Students who get Think Talk Write and Group Investigation Learning Models".

According to Elliot & Kenney (in Arif (2011), there are three characteristics that make mathematical communication different from everyday communication, namely: 1) To communicate mathematically students need to work with abstractions and symbols; 2) Often every part of the mathematical propositions is fundamental to understanding the whole proposition; 3) Every part of the mathematical proposition is very specific.

In line with the opinion of several experts above, Ministry of Education (2004: 6), states that the characteristics of junior high level mathematical communication include: 1) Making a model of a situation through oral, written, concrete objects, graphics, and Algebraic models: 2) Arrange reflections and make clarifications about mathematical ideas; 3) Develop a basic understanding of mathematics including the rules of mathematical definitions; 4) Use the ability to read, listen, and observe to interpret and evaluate a mathematical idea; 5) Discuss ideas, make conjectures / predictions, compile arguments, formulate definitions and generalizations; 6) Appreciating the values of a mathematical notation including its rules in developing mathematical ideas.

While the aspects of mathematical communication according to Elliot and Kenney (in Arif (2011), can be seen from: 1) Grammatical competence (grammatical competence); 2) Ability to understand discourse (discourse competence); 3) Sociolinguistic ability (sociolinguistic competence); 4) Strategic competence.

According to Vui (in Prayitno (2013) describes the relationship between mathematical communication and the level of questions based on the level of thinking. The illustration indicates that mathematical communication has several levels as the levels of thinking in solving problems, which include (1) explore and remember: facts, principles, and procedures, (2) practice exercises and skills, (3) solve problems, and (4) investigate (look at figure 1).

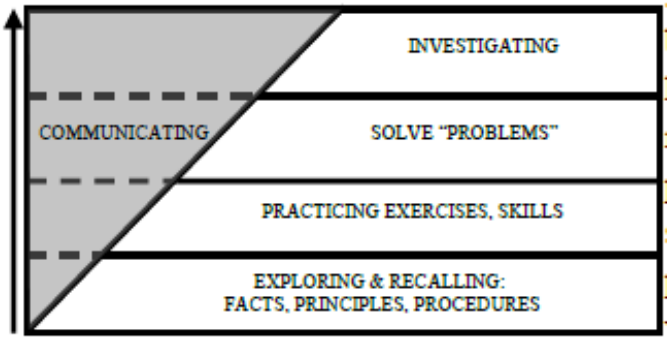

Figure 1. Mathematical communication and the level of the problem based on the thought process.

It is clear that mathematical communication skills are a way for students to communicate ideas, strategies and mathematical solutions both verbally (speaking) and written and reflect the understanding of mathematics so that students who learn mathematics are able to understand and use mathematical grammar which includes vocabulary and structure mathematics, understanding and describing important information from a mathematical discourse, knowing cultural or social information in the context of mathematical problems, and can decipher codes / codes in mathematical messages.

Think Talk Write (TTW) is a learning model that is based on the understanding that learning is a social behavior. The learning model introduced by Huinker and Laughlin (Huda (2013) is basically built through thinking, speaking, and writing. The flow of progress of the Think Talk Write (TTW) learning model begins with the involvement of students in thinking or dialogue with themselves after the reading process. Furthermore, talking and sharing ideas (sharing) with friends before writing, this model is a model that can train students' thinking and speaking skills. Suyatno (2009) suggests that the learning model think talk write is learning that begins with thinking in reading languages, the results of the reading are communicated with presentation. Suhendar (2011) suggests that the Think Talk Write (TTW) learning model basically uses cooperative learning strategies, so that in the implementation of this model heterogeneous students divide a number of students into a more effective learning atmosphere. According to Hamdayana (2014) the Think Talk Write (TTW) learning model involves four important stages that must be developed and carried out in learning, namely:

1. Thinking

Thinking activities can be seen from the process of reading a reading text, then taking notes on what has been read. In this stage, students individually think of possible answers (resolution strategies), take notes on what has been read, both in the form of what they know, as well as steps to resolve in their own language. Making small notes can improve students in thinking and writing.

2. Talking (Talk)

The next stage is talk that is communicating using words and languages that they understand. The communicating phase on this model allows students to be skilled at speaking. The process of communication in the classroom can be done by means of discussion. The discussion in the talk phase is a means to express and reflect on students' thoughts.

3. Write (Write)

The write phase is to write down the results of the discussion or on the student worksheet (LKS) provided. Writing activity means constructing ideas, because after discussion between friends then express them through writing. Writing activities will help students make connections and also allow teachers to see the development of students' concepts.

4. Presentation

This presentation is intended so that students can share opinions in a larger scope, namely with classmates. From the description above it can be concluded that the TTW learning model is a learning model that trains students to be able to build ideas in creating ideas, express ideas and share ideas with friends, and write the results of their thinking in the learning process.

Group Investigation (GI) is a form of cooperative learning model that focuses on student participation and activities to search for material (information) lessons to be learned through available materials, for example from textbooks or students can search the internet. Students are involved since planning, both in determining topics and ways to study them through investigation.

This model requires students to have good abilities in communication and in group process skills. Group Investigation (GI) can train students to grow independent thinking skills. Assume the development of GI type cooperative learning, namely: (1) Increasing students' creativity abilities can be achieved through developing a creative process towards awareness and development of tools that explicitly support creativity, (2) More optional components than irrational intellectuals are more important than rational ones, (3) To increase the chances of success in solving a problem must first understand the emotional and irrational components.

Students progress six stages according to Asma (2006: 62), namely as follows:

Stage I: Identifying topics and organizing into each working group, namely: (1) Students read quickly various sources, submit topics and organize suggestions, (2) Students join groups that are studying the topics they choose, (3) Group composition is based on interest and is heterogeneous, (4) The teacher assists and collects information and facilitates the organization.

Stage II: Plan an investigation in a group: students plan together what they will review and division of labor.

Stage III: Carry out investigations, including: (1) Students collect information, analyze data and reach conclusions. (2) Each group member contributes to the group effort. (3) Students exchange, discuss, explain and synthesize ideas.

Stage IV: Prepare the final report, among others: (1) Group members determine the very important things from the learning message that has been learned. (2) The group members plan what they report on how they will make their presentation. (3) Group representatives form a steering committee to coordinate plans for presentations.

Stage V: Presenting the final report, including: (1) Presentations carried out on all classes in various forms. (2) The presentation section must actively engage the audience. (3) The audience evaluates the clarity and attractiveness of the presentation according to predetermined criteria throughout the class.

Stage VI: Evaluation includes: (1) Students exchange feedback about the topic, about the work they are doing, and about their affective experiences. (2) Teachers and students collaborate in evaluating student learning. (3) Assessment of learning must evaluate higher level thinking.

Active student involvement can be seen from the first stage to the final stage of learning. The Group Investigation (GI) model has three main concepts, namely: research or inquiry, knowledge or knowledge, and group dynamics or the dynamic of the learning group, Winaputra (2001). The research here is the process of student dynamics in responding to problems and solving these problems. Knowledge is a learning experience that is obtained by students both directly and indirectly.

Research conducted by Sucianti (2007), the results of his research showed that student achievement using Think Talk Write (TTW) learning models was better than those using conventional learning models. And research conducted by Suherman (2013) revealed a difference in Snowball Throwing and Group investigation learning models in increasing understanding of students' mathematical concepts. The results of the study are that the Group Investigation learning model has an influence on improving students 'understanding of mathematical concepts because the two experimental classes have a positive response which causes students' attitudes to become more active.

METHOD

In this study, the method used by researchers was a quasi-experimental model with a sample of two groups. The group that uses the Think Talk Write (TTW) learning model as the experimental class 1 and the group that uses the Group Investigation (GI) learning model as the experimental class 2. The design of this study is two independent samples. According to Lestari and Yudhanegara (2015) a study of two mutually independent samples used the design of The Nonequivalent Prettest Contrl Group.

RESULTS AND DISCUSSION

Results

The results of this study include the initial test (pre-test) and final test (post-test) mathematical communication skills, the results of questionnaires, from 65 students who were the subjects of the study, 61 students who provided the data in full and according to the research needed, as many as 4 student data is not included in this study, because the student data in question is incomplete, due to not taking the pre-test, post-test and not filling out the questionnaire in full. Data obtained from 61 students, consisting of 31 students in the group who received the Think Talk Write (TTW) learning model and 30 students in the group that received the Group Investigation (GI) learning model.

1. Preliminary Test Data Analysis (Pre-test)

Analysis of the initial test data (pre-test) was obtained from Think Talk Write (TTW) class students and Group Investigation (GI) students. The initial test was conducted to determine the students' initial abilities before learning was given. After the data needed in this study is complete, the researcher then processes the initial test data based on the data processing steps in the previous chapter. From the results of these calculations, the following results are obtained:

Table 1. Description of the Initial Test (Pre-test)

Class	Total Students	Smallest Score	Score Biggest	Average		Standard deviation
				$\bar{x}$	%	
Think Talk Write (TTW)	31	2	12	6,17	28,05	2,28
Group Investigation (GI)	30	0	8	5,63	25,59	1,96

Based on table 1, the average score calculated for Think Talk Write (TTW) class students is as big as 28.05%, while the average for Group Investigation (GI) students is 25.59%. In the Think Talk Write class pre-test results (TTW has a greater average value than students in the Group Investigation (GI) class. However, for more details, a statistical test will be conducted.

The hypotheses formulated in the results of this pre-test are:

H_0: There is no difference in the initial ability of mathematical communication before learning between Think Talk Write (TTW) class students and Group Investigation (GI) students.

H_a: There are differences in the initial ability of mathematical communication between Think Talk Write (TTW) class students and Group Investigation (GI) students.

Next, to test the hypothesis a statistical test is carried out with the initial step of testing normality.

a. Normality Test Initial Test

Calculation of the normality of the initial test was carried out using the Liliefors Test. From the calculation results obtained:

Table 2. Normality Test Initial Test

Class	L_{maks}	L_{tabel}	Note
Think Talk Write(TTW)	0,143	0,162	Not normally distributed
Group Investigation (GI)	0,204	0,165	Normally distributed

Based on table 2, students in the Group Investigation (GI) class have a Ltabel abel Lmaks value so that the data is not normally distributed. Next is to test the pre-test hypothesis, statistical tests will be carried out using the Mann Whitney test.

b. Mann Whitney Test

After testing the normality of the data and the two data not normally distributed, the next step is the Mann Whitney Test. After calculating using a significance level of 5%, the following results are obtained:

Table 3. Uji Mann Whitney Data *Pre-Test*

Value of U	μ_u	$\sum T$	∂_u	Z_{hitung}	Z_{tabel}
389	465	621,5	64,68	-1,18	1,96

From table 3 it is obtained - 1.96 <-1.18 <1.96 so that Ho is accepted. Therefore, it can be concluded that there is no difference in the initial ability of mathematical communication between Think Talk Write (TTW) class students and Group Investigation (GI) students.

2. Final Test Data Analysis (Post-test)

To find out the difference in the final ability of mathematical communication, the two groups of students were given the final test (post-test). After the data in this study is complete, then the researcher conducts the final test data based on the final test processing steps in the previous chapter. From the calculation results obtained the average value of the calculated score and the standard deviation of the Think Talk Write (TTW) class with the Group Investigation (GI) class as in table 4 below:

Table 4. Description of the Final Test (Post-test)

Class	Total Students	Smallest Score	Score Biggest	Mean		Standard deviation
				$\bar{x}$	%	
Think Talk Write (TTW)	31	5	21	16,13	73,32	4,07
Group Investigation (GI)	30	6	22	5,63	76,23	4,01

Based on table 4, the average calculated score for Think Talk Write class is 76.23%. While the average for the Group Investigation class is 73.32%, this indicates that there is no significant achievement between the two classes. However, for more details, a statistical test will be conducted.

The hypotheses formulated in the results of this post-test are:

H_0: There is no difference in mathematical communication skills before learning between Think Talk Wite (TTW) class students and Class Investigation (GI) students.

H_a: There are differences in mathematical communication skills between Think Talk Wite (TTW) class students and Class Investigation (GI) students.

Next, to test the hypothesis a statistical test is carried out with the initial step of testing normality.

a. Normality Test of Final Test

Calculation of the normality of the final test was carried out using the Liliefors Test. From the calculation results obtained:

Table 5. Normality Test of Final Test

Class	L_{maks}	L_{tabel}	Note
Think Talk Write (TTW)	0,096	0,165	Normal distribution
Group Investigation (GI)	0,132	0,162	Normal distribution

Based on table 5, it was obtained Lmaks students who received the Think Talk Write (TTW) and Lmaks learning models of students who received a Group Investigation (GI) learning model less than Ltabel, with the criteria of a normally distributed data is Lmaks <Ltabel. get the Think Talk Write (TTW) learning model and data on students who get a normal Group Investigation (GI) learning model. Because the distribution of Think Talk Write (TTW) class and Group Investigation (GI) class data are normally distributed, homogeneity testing of the two experimental classes is then carried out using the two variance homogeneity test.

b. Homogeneity Test of Final Test Data

After the Think Talk Write (TTW) class and Group Investigation (GI) class data are normally distributed, the calculation is continued on testing the homogeneity of two variances. The homogeneity test of the final test data for Think Talk Write (TTW) and Group Investigation (GI) classes was calculated using the F-test. From the calculation results obtained the following data:

Table 6. Test the Homogeneity of the Two Final Test Variances

Class	Varians	F_{hitung}	F_{tabel}	Note
Think Talk Write (TTW)	4,07	1,03	1,85	Homogen
Group Investigation (GI)	4,01			

Based on table 6, it can be seen that the variance value for the Think Talk Write (TTW) class is greater than the variance of the Group Investigation (GI) class. Then Ftable is obtained with dk1 = 30 and dk2 = 29 and by taking the significance level α of 5% obtained by Ftable of 1.85. This shows that $F_{count} < F_{table}$ then the two variances are homogeneous. Because both classes are homogeneous, then the t test is then carried out, the purpose of which is to test the hypothesis of the final test data.

c. Test t Final Test Data

After statistical tests and both variances were homogeneous, the next statistical test was to test the similarity of two Think Talk Write (TTW) class and Group Investigation (GI) classes through t test. to test the following hypothesis:

H_0: Mathematical communication skills of students who get a model Think Talk Write (TTW) class learning is no better than students who are get a Group Investigation (GI) learning model.

H_a: Mathematical communication skills of students who get a model Think Talk Write (TTW) class learning is better than students who are get a Group Investigation (GI) learning model.

Next, to test the hypothesis a statistical test is performed with

Table 7. Recapitulation of Results of Test Calculation t Final Test Data

Class	Total Students	Mean $\bar{x}$	Mean %	Standard deviation	$S_{combined}$	t_{count}
Think Talk Write (TTW)	31	16,13	73,32	4,07	7,685031	0,0108
Group Investigation (GI)	30	16,77	76,23	4,01		

From table 7, the combined standard deviation ($S_{combined}$) value is 7.685031, so that the t_{count} is 0.0108. The table = 2.0010 is obtained with a significance level of 5% and degrees of freedom (db) = 61. This shows that t_{count} = 0.0108 abel t_{table} = 2.0010, so that it is in the reception area H_0, in other words communication skills Mathematically students who get the Think Talk Write (TTW) learning model are no better than students who get a Group Investigation (GI) learning model.

3. Gain Analysis

Normalized data gain analysis aims to determine the magnitude of improvement in students' mathematical communication skills. The increase in size before and after learning is

calculated using the normalized gain formula. To find out how much improvement in students' mathematical communication skills from the calculation results can be seen in the following table:

Table 8. Description of Gain Data Normalized

Class	Total Students	Score Min.	Score Max.	Mean		Standard Deviation
				Value	Interpretasi	
Think Talk Write (TTW)	31	0,11	0,94	0,63	medium	0,23
Group Investigation (GI)	30	0,07	1,00	0,67	medium	0,25

From the data above it can be seen that the normalized gain obtained from the Think Talk Write (TTW) class obtained a normalized gain minimum score of 0.11 and a maximum score of 0.94, so that the normalized gain average value was 0.63 with an increase in interpretation classified, while the results of the normalized gain calculation from the Group Investigation (GI) class obtained a normalized gain minimum score of 0.07 and a maximum score of 1.00, so that the normalized gain average was 0.67 with a moderate interpretation.

The quality of improving the ability of mathematical understanding of students in Think Talk Write (TTW) and Group Investigation (GI) classes can also be presented in the percentage table as follows:

Table 9. Increase Quality Percentage Recapitulation Mathematical Understanding Ability After Given Learning

No	Category	*Think Talk Write (TTW)*		*Group Investigation (GI)*	
		Many Students	%	Many Students	%
1	Height	14	45	15	50
2	Medium	14	45	13	43
3	Low	3	10	2	7
	Total	31	100	30	100

In the Think Talk Write (TTW) class there were 14 students classified as high with a percentage of 45% while in the Group Investigation (GI) class there were only 15 students categorized as high with a percentage of 50%. For the category of Think Talk Write (TTW) there are 14 students with a percentage of 45% and a Group Investigation (GI) class with 13 students with a percentage of 43%. Next is the low category, in the Think Talk Write (TTW) class there are 3 students belonging to this category with a percentage of 10%, while in the Group Investigation (GI) class there are 2 students with a percentage of 7%.

4. Results of Questionnaire Analysis

Questionnaire is one of the instruments used to determine the effect of the learning model used on student attitudes. Questionnaires were given to both the Think Talk Write (TTW) class and the Group investigation (GI) class. The questionnaire made in this study was 14 statements.

Of the 14 statements consist of various aspects, so in this study the researcher discusses the analysis of the interpretation of student attitudes as a whole, interpretation of the scale of

student attitudes toward each indicator and interpretation of each individual towards mathematics learning using Think Talk Write (TTW) learning models and Group Investigation (GI) as well as questions about mathematical understanding.

Discussion

Think Talk Write (TTW) class attitude scale analysis.

1) **Interpretation of attitude scale in general Think Talk Write (TTW) class students**

On the scale of the Think Talk Write (TTW) class attitudes obtained a maximum value of 2170, a minimum value of 434, a range of 1736 and a class length of 347 to obtain a response scale. Recapitulation of Attitude Interpretation can be seen in the following table:

Table 10. Recapitulation of interpretations of the overall attitude of Think Talk Write (TTW) class students

No	Aspect	Sub Total	Total	Note
1	Students' Attitudes towards Think Talk Write (TTW) Models	864	1665	Good
2	Students' Attitudes toward Mathematical Understanding Questions	801		

From table 10 it can be seen that the total Think Talk Write (TTW) class total score is 1665. The total score obtained from the total score of each statement, both positive and negative statements. The total score of 1665 lies in the range of response scales between 1475,61822,8. So the interpretation of students' attitudes in general on the Think Talk Write (TTW) class regarding student attitudes towards mathematics learning with and on mathematical understanding questions shows a good attitude.

2) Interpretation of the attitude scale of each Think Talk Write (TTW) class student

In determining the interpretation of the attitudes of students each individual as well as calculating the attitude of students as a whole In these data, the interpretation of each student's attitude scale towards mathematics learning is based on the Think Talk Write (TTW) learning model. On the data of interpretation of the attitude scale of each Think Talk Write (TTW) class student, on mathematics learning using Think Talk Write (TTW) learning models and mathematical understanding questions are classified as very good, good and sufficient interpretation. Also presented as a percentage, to recapitulate the percentage of the scale of each Think Talk Write (TTW) class can be presented in the following table:

Table 11. Percentage of Attitudes for Each Individual Think Talk Write (TTW) Class Student

No	Category	Many Students	Percent
1	Very Good	21	68
2	Good	7	23
3	Enough	3	10
	Total	31	100

From table 11 it can be seen that the number of students classified as very good category as many as 23 students with a percentage of 68%, the number of students classified as good

categories as many as 7 students with a percentage of 23% and many students classified as enough categories as many as 3 people with a percentage of 10% .

So, it can be concluded that students' interpretation of mathematics learning using Think Talk Write (TTW) learning and on mathematical understanding questions shows a good attitude.

b. Attitude Scale Analysis of Group Investigation (GI) Classes

1) Interpretation of the Scale of the Overall Attitude of Students in the Group Investigation (GI) Class.

On the scale of attitude of the Group Investigation (GI) class obtained a maximum value of 2100, a minimum value of 420, a range of 1680 and a length of class 336 so that the scale of responses was obtained. Recapitulation of Attitude Interpretation can be seen in the following table:

Table 12. Recapitulation of Interpretations of the Overall Attitude of Students in Group Investigation (GI) Classes

No	Aspek	Sub Total	Total	Note
1	Students' Attitudes towards Group Investigation (GI) Learning Models.	817	1574	Good
2	Students' Attitudes towards Mathematical Understanding Questions.	757		

From table 12 it can be seen that the total score of the Group Investigation (GI) class is 1574. The total score obtained from the total score of each statement, both positive and negative statements. The total score of 1574 lies in the range of response scales between 1428.0 - 1764.0. So the interpretation of the overall attitude of the students in the Group Investigation (GI) class regarding students' attitudes towards mathematics learning and to the questions of mathematical understanding showed a good attitude.

2) Interpretation of the Attitude Scale for Individual Students in the Group Investigation (GI) Class.

In determining the interpretation of the attitudes of students each individual as well as calculating the attitude of students as a whole. In these data, the interpretation of each student's attitude scale towards the learning of mathematics is listed using the Group Investigation (GI) learning model.

In the interpretation of attitude scale data of each individual student in the Group Investigation (GI) class towards mathematics learning using the Group Investigation (GI) learning model and mathematical understanding questions are classified as good, sufficient and ugly. Also presented in the form of a percentage, to recapitulate the percentage attitude scale of each individual Group Investigation (GI) class can be presented in the following table:

Table 13. Percentage of Attitudes for Individual Students in Group Investigation (GI) Classes

No	Category	Many Students	Percent
1	Very Good	5	17
2	Good	19	63

3	Enough	6	20
	Total	30	100

From table 13 it can be seen that the number of students classified as very good category as many as 5 people with a percentage of 17%, the number of students classified as good categories as many as 19 people with a percentage of 63%, and many students classified as enough categories as many as 6 people with a percentage of 20 %. Student attitudes towards the Group Investigation (GI) learning model and student attitudes towards mathematical understanding questions that have the same category, namely good.

So, it can be concluded that students' interpretation of mathematics learning by using Group Investigation (GI) learning and on mathematical understanding questions shows a good attitude.

CONCLUSION

Mathematical communication skills of students who get a Group Investigation (GI) learning model are better than those who get the Think Talk Write (TTW) learning model. Increased mathematical communication skills of students who get Think Talk Write (TTW) learning models are interpreted moderately. Increased mathematical communication skills of students who get a Group Investigation (GI) learning model are interpreted moderately. Students' overall attitude towards mathematics learning uses Think Talk Write (TTW) learning models. interpreted as good. The overall attitude of students towards mathematics learning using the Group Investigation (GI) learning model is interpreted as good.

ACKNOWLEDGMENTS

On this occasion the author would like to thank the Head of Leuwigoong 1 Public Middle School, Lecturer in Research Methods in the Masters Program in mathematics education, Supervisor and friends, who have helped to complete the Class Action Research Article. Hopefully all the assistance that has been given to the author becomes a practice that will get a reply from Allah, SWT.

REFERENCES

Fariyah (2013). Application of the Group Investigation (GI) cooperative learning model, to improve student activity and learning outcomes. [Onlne]. Available: http://lib.unnes.ac.id/19240/1/7101408279.pdf.

Izzati, N. & Suryadi, D. (2010). Mathematical Communication and Realistic Mathematics Education. The paper was presented at the Nasinal Seminar at the Mathematics Education Department of FMIPA UNY, Yogyakarta on November 27, 2010.

Ramdhani N. (2014) Effect of Quantum Teaching Learning Model Using Information Technology and Communication (Tik) Against Students' Mathematical Communication Capabilities. STKIP Garut: Not published

Shadiq, F. (2007). Report on the Results of Seminar and Workshop on Learning Mathematics in the Mathematics Teacher Study Program on March 15-16, 2007. Available at http://fadjar3g.files.wordpress.com/ 2008/06/07-lapsemlok_limas.pdf.

Turmudi. (2008). Solving Mathematical Problems. [On line]. Available: http://file.upi.edu/Dirirect/FPMIPA/Jur._Pend._Matematika/196101121987031-Turmudi/F20-Pemecahan_Masalah_Matematika-1-11-2008.pdf.