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THE EFFECT OF THE THREE-STEP INTERVIEW *TYPE COOPERATIVE LEARNING MODEL* ON THE MATHEMATICAL COMMUNICATION SKILLS OF MTS ROUDOTUSSALAM STUDENTS ON TRIANGULAR AND QUADRILATERAL MATERIAL

Lilik Amalia[1], Hamidah[2], Vidya Ayuningtyas[3]
[1,2,3]Universitas Bina Bangsa, Indonesia
Email: shiroimida@gmail.com

Abstract

This research is based on the background that teachers still use the one-way lecture learning model which the teacher dominates, thus making students passive, lack of students' mathematical communication skills, especially in learning mathematics.. This study aims to: (1) determine the differences in the initial abilities of students in the experimental class and control class; (2) find out whether students' mathematical communication skills given the Three Step Interview type cooperative model are better than the conventional model; (3) find out how the influence of the learning model cooperative type Three Step Interview on students' mathematical communication skills.

This research is an experimental study with a Nonequivalent Control Group research design. Data collection techniques using a mathematical communication ability test which consists of four question in the form of a description. Te date analysis technique was carried out by normality test, homogeneity test, average difference test, and effect size. Based on the calculation of hypothesis test 1, obtained t_(count) 1.056 and t_(table) 1.685 at a significance level of 5%, which means t_(count) > t_(table) (1.056 <1.685) Then H_(0) is accepted. Test hypothesis 2 obtained t_(count) 3.016 and t_(table) 1.685 at a significance level of 5% which means t_(count)> t_(table) (3.016 > 1.685) then H(0) is rejected and H(1) received. The effect size test is 0.9796, so the interpretation criteria are high.

So it can be concluded that: (1) there is no difference in the initial abilities of the experimental class and control class students; (2) the mathematical communication ability of students who are given the Three Step Interview type of cooperative learning model is better than the conventional learning model; (3) the effect on the cooperative learning model Type Three Step Interview on students' mathematical communication skills is high.

Keywords: *Cooperative Type Three Step Interview, Mathematical Communication Ability.*

INTRODUCTION

Along with the times, the quality of human resources needs to be improved continuously to compete in the future. One of the efforts to improve the quality of human resources in the form of a person's mindset and potential is education, informally (in the family, community) and through formal institutions (schools). Inanna (2018) stated that education is a planned effort in the process of guidance and learning for individuals to develop and grow into independent, responsible, creative, knowledgeable, healthy, and noble morals regarding physical and spiritual aspects.

The learning provided in schools includes several branches of science, one of which is mathematics. According to the National Council Of Teachers Of Mathematics (2000), five fundamental abilities are standard mathematical abilities: *problem* solving, *reasoning and proof*, *communication*, *connection,* and representation. Mathematics is part of science that contributes significant assistance to the development of science

and human resource development. Based on his description above, it can be seen that mathematical communication skills are one of the goals of learning mathematics.

Rachmayani (2014), mathematical communication is a link of a real thing (there is physical) into mathematical language such as images, symbols, and diagrams. Mathematical communication can explain mathematical ideas and relations using real objects around them, express everyday events in mathematical language and listen, discuss, write, and read with an understanding of mathematical language and construct arguments and formulate definitions. So it can be concluded that mathematical communication is students' ability to express mathematical ideas in real-world phonemena through graphs, figures, tables and algebraic equations.

According to Ramdani (2016), mathematical communication skills are the ability to be able to communicate including activities using skills such as: writing, listening, studying, interpreting, evaluating ideas, symbols, terms, and mathematical information observed through the process of listening, presenting, and discussing. Mathematical communication skills are the abilities possessed by students in order to be able to present, evaluate ideas, symbols, terms obtained through the process of listening and discussion. Students with good mathematical communication skills, are expected to formulate problems, plan solutions and conclude answers.

The importance of mathematical communication skills for students makes these abilities need to be developed in every mathematics learning, including mathematics learning in Junior High School (SMP). Mathematics learning activities in schools to date have not shown satisfactory results. This can be seen from the observation of Noviyanti (2017) where many students still have difficulty explaining what has been learned. Zuhrotunnisa (2015) conducted a similar study and concluded that students' mathematical communication skills in explaining ideas using tables, diagrams, or everyday sentences are still relatively low.

There are two main reasons underlying the importance of mathematical communication skills in mathematics learning. First, mathematics is a tool to communicate mathematical ideas, precisely, and concisely. Second, in the mathematics learning process, social activities also occur that involve interaction between students and students and teachers (Ainul et al, 2019)

Based on the results of interviews with grade VII mathematics teachers, the problems found among them, teachers still use learning with the lecture method. This can result in students only fixating on the teacher's explanation. As a result, students do not have the creativity to seek their knowledge which is further communicated with their peers. To overcome this, choosing the right learning model in the learning process is necessary. However, according to previous research Aisyah, Dahlan, Priatna (2016) suggested that the problem in choosing the right learning model is still a fundamental obstacle for teachers because students' mathematical communication skills are still low. Barkley, Cross, and Major (2012) revealed that the *Three Step Interview* type cooperative learning model is one of the effective ways to train students' written mathematical communication skills and has three steps: interview I, interview II, and report.

The Three Step Interview *type cooperative learning model* is learning that can foster motivation, activate students to ask questions and answers to each other, student communication skills, and student communicative in learning activities. The learning in the 2013 curriculum according to Permendikbud No. 18 A of 2013 is based on observing, questioning, collecting information, reasoning / analyzing, and communicating. Learning with the Three Step Interview model means learning

activities are applied by the steps of the *Three Step Interview* learning model *combined with learning activities in the 2013 curriculum (Sholihah, 2018).*

According to Aisyah, et al (2016) the *Three Step Interview* type cooperative learning model can train students' ability to communicate with interlocutors, so it supports students in communicating mathematical ideas to turn mathematical problems into mathematical models, when students are active in asking questions, that is where students are trained to develop mathematical communication skills by explaining or justifying solutions to others.

The advantage of the Three Step Interview type cooperative learning model with other learning models to train students' mathematical communication skills is at the stage of the *Three Step Interview* type cooperative learning model*.* The implementation of this technique is to divide students into small groups of four students. Before conducting the interview, the four students were given different questions and completed their assignments still. Then they pair up with each other and explain the idea in turn. After that, students group and explain the ideas they get from their mates. In the end, some groups present the ideas obtained in the group.

In the opinion of Sinaga, Zulkardi, and Yusup (2016), Quadrilateral and Triangular material is a fundamental material that students must understand, because it is closely related to everyday life. In addition, the Quadrilateral and Triangular materials are prerequisite materials for students studying different geometry materials, such as building cubes, blocks, prisms, and pyramids (Sumiati & Agustini, 2020). However, in reality, students still have difficulty learning the Quadrilateral and Triangle material. In addition to the results of the researchers' interviews with junior high school teachers, this is also in line with the results of Amelia, Aripin, and Hidayani's (2018) research which states that some students have difficulty in determining the shape of different triangles with the same circumference, forget formulas, difficulty in coming up with ideas and difficulties in mathematical communication related to Quadrilateral and Triangular materials.

METHODS

This type of research uses a type of quantitative research with experimental methods. This study is to determine the effect of the Three Step Interview *Type Cooperative* learning model on the mathematical communication skills of MTs Roudotussalam students on Triangle and Quadrilateral Material.

The population in this study is all grade VII students at MTS Roudotussalam The 2021/2022 academic year is even semester consisting of 2 classes with a total of 40 students. The samples used in this study were carried out by saturated *sampling*. The saturated *sampling* method is used in research if all population members are sampled (Pratama &; Wardani, 2018). The classes sampled were class VII A consisting of 20 students as an experimental class and class VII B consisting of 20 students as a control class.

The instrument used in this study is a description test question. Test instruments are used to obtain data on students' mathematical communication skills before and after treatment.

The data collection technique in this study is in the form of a mathematical communication ability test. Each class was given a *Pretest* and *Posttset* to obtain learning outcome data before being given a Cooperative Learning Model Type *Three Step Interview.* The data analysis techniques used in the study are as follows: (1) using the average difference test to answer the formulation of problem 1, namely knowing the difference in the initial abilities of experimental and control class students;

(2) using the average difference test to answer the formulation of problem 2, namely knowing the communication skills of students given learning the Three Step Interview *Type Cooperative* model better than the conventional model; (3) use *Effect Size* to answer the formulation of problem 3, namely knowing how the influence of the Three Step Interview Type Cooperative *learning model on* the mathematical communication skills of MTs Roudotussalam students on Triangle and Quadrilateral Material.

RESULT AND DISCUSSION

Research Results

a. Data Analysis Initial Capabilities

1. Average Difference Test *(Pretest)*

After the homogeneity test, the data was tested to determine the average difference between the two classes before being given the material to be taught. The average difference test is carried out by testing the initial test data or *pretest* with the help of *SPSS 16* software. The results of the average difference test in this study are presented in the following table.

Table 3. Test Results The Difference Between Experimental Class and Control Class

Pretest	*Sig.*	t_{hitung}	t_{tabel}	Information
	0,304	1,056	1,6859	H_0 Accepted

Based on table 3, the sig value obtained in the initial ability test of 0.304 is greater than 0.05. So it can be concluded that the average difference value of the initial ability of the experimental class and control class students has no difference.

b. Final Capability Data Analysis

1. Test Average Difference *(postest)*

After the homogeneity test, the data was tested to determine the average difference between the two classes before being given the material to be taught. The average difference test is carried out by testing the initial test data or *pretest* with the help of *SPSS 16* software. The results of the average difference test in this study are presented in the following table.

Table 6. One-party t-test result on final test data

One-Party Test	t_{hitung}	t_{tabel}	***Sig***	**Information**
Final Test Data	3,016	1,6859	0,009	H0 rejected

Based on the results of table 6 shows that the final test data gets results of 3.016 > 1.6859 and the significance value obtained is 0.005 < 0.05. So it can be concluded that $t_{hitung} > t_{tabel}$H0 is rejected and H1 is accepted, this means that the mathematical communication skills of students given the Three Step Interview *type cooperative* learning model are better than conventional learning models.

c. *Effect size*

This effect size was used to determine how much influence the Three Step Interview *type cooperative learning model* had on students' mathematical communication skills using *Effect Size.* The calculation results using *effect size* can be seen in table 7 below.

Table 7. Effect Size Results

Class	Average	Standard Deviation	*Effect Size*	Information
Experiment	82,75	6,172	0,9796	Tall
Control	76,00	7,881		

Based on table 7 shows that the *Effect Size gain* of 0.9796 is included in the high category. So it can be concluded that the magnitude of the influence of the Three Step Interview *type cooperative* model on students' mathematical communication skills in mathematics subjects is high.

Discussion

1. Initial Capabilities of Experiment and Control Classes

In this study, researchers wanted to determine students' initial ability before being given learning by giving tests of mathematical communication skills (*Pretest*). Initial abilities are students' abilities before being given treatment or learning. Early ability in learning mathematics is very important because this can be useful in learning, by knowing the initial ability of students researchers can know the extent to which students know the material to be given (Syriac, Jufri, &; Princess 2020). To find out the initial ability of the student, researchers conduct: *Pretest*. *Pretest* conducted before students are given treatment of Triangle and Quadrilateral material.

Based on the results of calculating the initial ability of students the average score of the *pretest in the experimental class and the* control class showed that the initial ability of students to triangular and quadrilateral material was not much different, the results of the calculation of *Lilifors* and the Independent Sample T Test concluded that the data from both classes were normally distributed and homogeneous. The results of the Paired Sample T Test showed that there was no difference in the average initial ability of experimental and control class students

After being given *a pretest*, the experimental class was given treatment by applying the Three Step Interview type cooperative learning model and the control class applying the conventional learning model.

2. Mathematical Communication Skills of Experimental Class and Control Class

After being treated in the experimental class using a cooperative learning model type *Three Step Interview* and a control class using a conventional learning model, researchers gave *postests* both in the experimental class and the control class which were used to test data on mathematical communication skills. Furthermore, *the postest* data is tested for normality and homogeneity before the hypothesis test.

The results obtained after normality tests in the experimental class and control class, experimental class and control class have a sig value of > 0.05, this means that the analysis of student mathematical communication ability test data is normally distributed. While the results of obtaining significant values of homogeneity tests in the experimental and control classes have a sig value of < 0.05 which shows that the data from both classes are homogeneous.

Based on the results of the hypothesis test calculation using the help *of SPSS* software*, the Independent Sample* T Test showed that the mathematical communication skills of the experimental class given the Three Step Interview *type cooperative* learning model were better than the control class using conventional

learning models shown by the results of the *Independent Sample T Test* $t_{hitung} > t_{tabel}$.

The results of this study are from the results of research conducted by Kamilah (2017) which states that the improvement of mathematical communication skills of students who obtain mathematics learning with the Three Step Interview type cooperative learning model is better than that of conventional learning models.

In addition, Fathia (2013) in her research stated that the quality of improving mathematical communication skills of students who received learning with the *Three Step Interview* learning model was moderate, while the quality of improving mathematical communication skills who received learning with conventional learning models was fairly low.

3. The Effect of the Three Step Interview *Type Cooperative Learning Model* on Mathematical Communication Skills

Based on the results of the calculation of the third hypothesis in the calculation of Effect size there is a high influence of the experimental class with the control class, this shows that the cooperative *learning model type Three Step Interview* affects mathematical communication skills. The results of this study are from previous research conducted by Ulfah (2018) which stated that the application of the *Three Step Interview* type cooperative learning model in mathematics learning influences on improving students' mathematical communication skills.

The advantage of the *Three Step Interview* type teaching model with the conventional learning model is that it can help students develop communication and language skills. In addition, students who are initially passive in expressing their opinions about the material being studied will become more courageous to express their difficulties because the interviewee is his friend. The stages of mathematical communication skills in the *Three Step Interview* cooperative learning model include interviews, discussions and presentations. A person with another person interviews to get information. In this interview stage, students A and B and students C and D can interact with each other to ask questions and answers to what they understand and do not understand. After that discussion, discussion is an exchange of ideas between two or more people to resolve the topic of the question. This stage of discussion allows students to exchange opinions in groups that can produce an understanding of their mathematical ideas. According to Sagala (2009) discussion is a responsive scientific conversation containing the exchange of opinions established with hard questions, the emergence of ideas or opinions, carried out by several group members who are directed to obtain solutions to problems and to seek truth. Then after the interview and discussion stage is carried out next, namely the presentation stage, presentation is one form of communication that requires students to be able to communicate in front of the class in order to release the results obtained from discussions and interviews.

CONCLUSION

Based on the research that has been done, several conclusions can be drawn as follows:

1. There was no difference in the initial ability of the experimental and control class students.
2. The mathematical communication skills of students given the *Three Step Interview* type cooperative learning model are better than classes given the conventional learning model.

3. The influence of the Three Step Interview *type cooperative learning model* on students' ability at MTs Roudotussalam Songgom Jaya is high.

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