

IMPROVING MATHEMATIC COMMUNICATION ABILITY CLASS OF VII A STUDENTS SMP NEGERI 11 CIMAHI ON FLAT BUILDING MATERIALS FOUR THROUGH THINK- TALK -WRITE (TTW) APPROACHES

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Abstract

This study aims to increase the mathematical communication skills of students at class VII A on rectangular flat material through the Think-Talk-Write (TTW) approach in SMP Negeri 11 Cimahi. This type of research is CAR or Classroom Action Research using a model from Kemmis and McTaggart with spiral research, the population sample are all students of class VII A Cimahi 11 Public Middle School consisting of 36 students. This study to be composed of 3 cycles in which each cycle to be composed of the 3 stages that is planning, implementation, and observation reflection, before and after the study was given an instrument test in the form of a description test. In each cycle there is an activity observation sheet. The results of this study indicate that students' mathematical communication skills can be increase through the Think-Talk-Write (TTW) approach application.

Keywords: Mathematical Communication, Think-Talk-Write (TTW), Classroom Action Research

Abstrak

Penelitian ini bertujuan untuk meningkatkan kemampuan komunikasi matematik siswa kelas VII A pada materi bangun datar segi empat melalui pendekatan *Think-Talk-Write* (TTW) di SMP Negeri 11 Cimahi. Jenis penelitian ini adalah PTK atau Penelitian Tindakan Kelas dengan menggunakan model penelitian spiral dari Kemmis dan McTaggart dengan sampel populasi seluruh siswa kelas VII A SMP Negeri 11 Cimahi yang terdiri dari 36 siswa. Penelitian ini terdiri dari 3 siklus, setiap siklusnya terdiri dari 3 tahap yaitu tahap perencanaan, pelaksanaan, observasi refleksi. Sebelum dan sesudah penelitian diberikan instrumen berbentuk tes uraian. Pada setiap siklusnya terdapat lembar observasi aktivitas. Hasil dari penelitian ini menunjukkan bahwa kemampuan komunikasi matematik siswa dapat ditingkatkan melalui penerapan pendekatan *Think-Talk-Write* (TTW).

Kata Kunci: Komunikasi Matematik, *Think-Talk-Write* (TTW), Penelitian Tindakan Kelas

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INTRODUCTION

The skill of mathematical communication are mathematical abilities that are very important and must be possessed by every student. This is in accordance with the objectives of secondary school mathematics learning which are listed in the 2006 KTSP curriculum curriculum (Hidayat, Sumarmo, 2013). In line with NCTM (National Council of Teachers of Mathematics) establishes five basic mathematical abilities that are standardized, one of which is the skills of mathematical communication (Fahradina, Bansu, Ansari & Saiman, 2014). The importance of having mathematical communication skills is reflected in Permendiknas Number 22 of 2006 concerning Standard Content of Mathematics Subjects, mathematics learning purposed is that students can be communicate ideas with tables, symbols, diagrams, or other media to clarify problem or the situation faced (Syamsudin, Afrilianto, & Rohaeti, 2018). Having the skills of mathematical communication is a concern, this is reflected in the role of mathematics as a language of symbols and communication tools that are strong, concise, concise, accurate, precise, and do not have a double meaning Wahyudin (Isnaeni & Maya, 2014).

According to Ruseffendi (Rahmawati, Bernard, dan Akbar, 2018) said that mathematics using symbols and terms makes mathematical characteristics as a language we really need to understand previously agreed upon so that it requires good the skills of communication in learning mathematics. While Purwandari, Astuti & Yuliani (2018) stated that with a good skills of communication can foster a rational mindset of students to continue to innovate in all aspects of their lives

From the analysis of some of Sumarmo's expert opinions (Hendriana, Sumarmo, dan Rohaeti, 2013) explain mathematical skills of communication include the ability: to express a situation into mathematical language, ideas, symbols, and mathematical models; explain and meaningfully read, state, interpret, understand, and evaluate mathematical ideas and mathematical offerings verbally, in writing, or visually; listen, discuss and write about mathematics; and express an argument in his own language.

In accordance with the statement above, indicators the skills of mathematical communication proposed by Sumarmo (Yuliani, 2015) are as follows: 1) State a situation, picture, diagram, or real object into language, symbols, ideas or mathematical models; 2) Explain mathematical or verbal ideas, situations, relations; 3) Discussing, listening, and writing about mathematics; 4) Reading with an understanding of a written mathematical representation; 5) Re-express a paragraph or mathematical description in their own language.

In this study, the indicators that have been modified by researchers with indicators of the skills of mathematical communication as follows: 1) To connecting the real objects, diagrams, and pictures, into mathematical ideas and or mathematical symbols; 2) To explain the ideas, situations, mathematical relations, verbally and in writing using real objects, pictures, graphics, algebraic expressions; 3) Stating everyday events in language or mathematical symbols or composing a mathematical model of an event; 4) Explain and make questions about mathematics that have been learned; 5) Making conjectures, compiling arguments, formulating definitions and generalizations.

Based on the facts of the findings in the field from a number of studies revealed that the skills of mathematical communication still need to be improved for junior high school students. By the results of a study from the TIMSS report (Fachrurazi, 2011) explaining the low of the skills of mathematical communication of junior high school students still very far and low

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below other countries. The lack of mathematical communication skills in junior high schools is due to students still tend to be less active, many teachers teach conventional methods with lecture and assignment methods only. This factor causes many students to be confused and have difficulty in completing mathematical problems, students are increasingly difficult when confronted with problems with the type of High Order Thinking Skills (HOTS) in the form of application problems in daily life.

This is in line with the opinion of Ruseffendi (Afrilianto, 2015) saying the skills of mathematical communication low in students can be caused by teacher errors in the presentation, methods, props used when teaching. Therefore, very important in choosing an approach, strategy or method to be applied to mathematics learning so that students can easily understand a concept and the goal of mathematics education will be maximally achieved.

As for one solution that can overcome the problem above, with the TTW (Think-Talk-Write) approach. TTW approach is one of cooperative learning that emphasizes thinking, composing, testing, reflecting and writing ideas (Lestari & Yudhanegara, 2015). Through this approach students are actively involved through the thought process of the material presented in teaching materials, then students communicate the results of their thoughts both in small groups and present them in front of the class. According to Rohaeti, Hendriana, & Sumarmo, (2019) the Think-Talk-Write (TTW) approach after thinking and communicating processes then based on the results of the discussion the students rewrote with the improvement of the material in the teaching material they learned, so that students are expected can be able to find concepts and apply their concepts in daily activities.

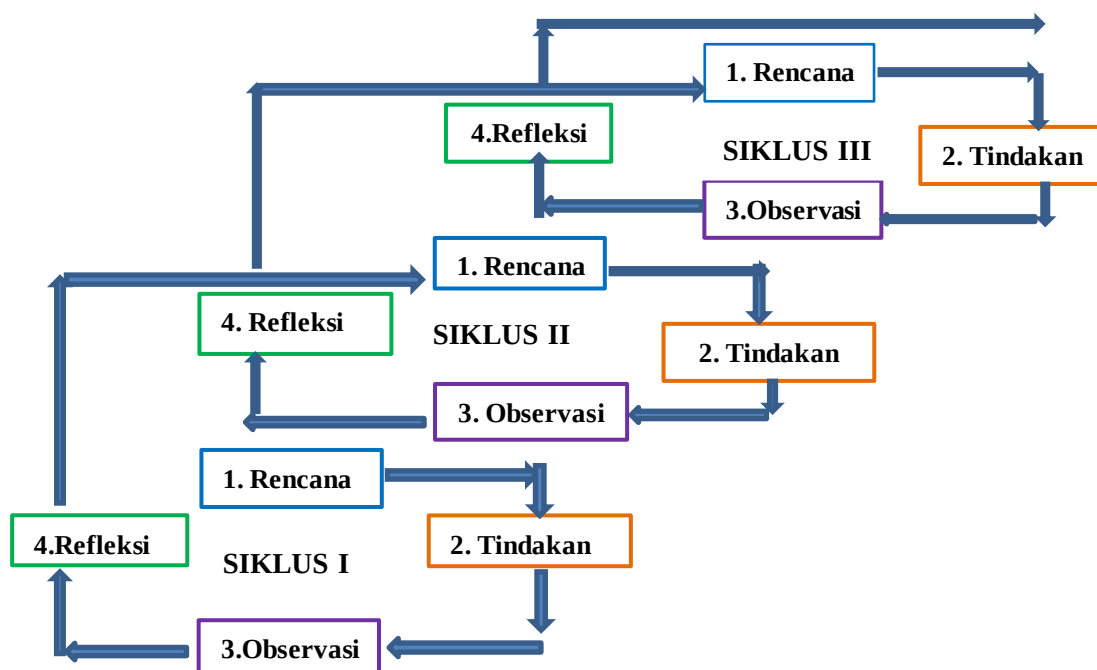
Based on the explanation and the result above, and discussion with the class teacher, it was agreed with an alternative solution to solve the problems that occurred is to conduct a study to improve the skills of mathematical communication in students, entitled "Improving Mathematical Communication Skills of Class VII A Students of Cimahi 11 Middle School. on Rectangular Flat Build Material with Think-Talk-Write (TTW) Approach ".

METHOD

In this research used the method of CAR (Classroom Action Research), which is research that is intended to provide information on how appropriate actions to increase the teaching abilities of teachers to teach and student potential. In this study used the model of Spiral Action Research from Kemmis and McTaggart (Hendriana, H., & Afrilianto, M. 2017). The model of spiral research consists of planners, action, observation and finally reflection in each cycle, research with this spiral model will be stopped if the research objectives carried out have been achieved. In this study, 36 students grade VII A of SMP Negeri 11 Cimahi used as the subject. Indicators of success of this study can be seen from two indicators, namely (1) The learning process both for students and for teachers with a minimum achievement of successful implementation of actions following the learning implementation plan is 85%, (2) The student learning success in term if at least 75% of students individually get a value above the KKM. The implementation of learning activities in each cycle uses observation sheets of students and teacher activities with the highest score of 4 if the students and teacher carry out these activities according to the conditions agreed with the following class teacher. Examples of observation sheets of students and teacher activities can be seen in Table 1 and the Kemmis and McTaggart Research Models in Figure 1.

Tabel 1. The following are examples of observation sheets on student and teacher activitie

Aspects observed in the teacher	Score	Aspects observed in the students	Score
The teacher conveys material information and learning objectives	1-4	Students pay attention to the teacher in conveying material information and learning objectives	1-4
The teacher motivation to students, the benefits of studying this material	1-4	Students paying attention to the teacher provide motivation	1-4
The teacher held an apperception	1-4	Students actively respond in apperception	1-4
The teacher explanation of the material to be taught	1-4	Students pay attention to the teacher's explanation	1-4
The teacher gives LKS as teaching material	1-4	Students individually read, think, and understand each question and statement on the worksheet	1-4



RESULTS AND DISCUSSION

Results

Recapitulation of student and teacher observations on CAR (Classroom Action Research) into students' mathematical communication abilities using the TTW (Think-Talk-Write) Approaches are presented in Figure 2 below:

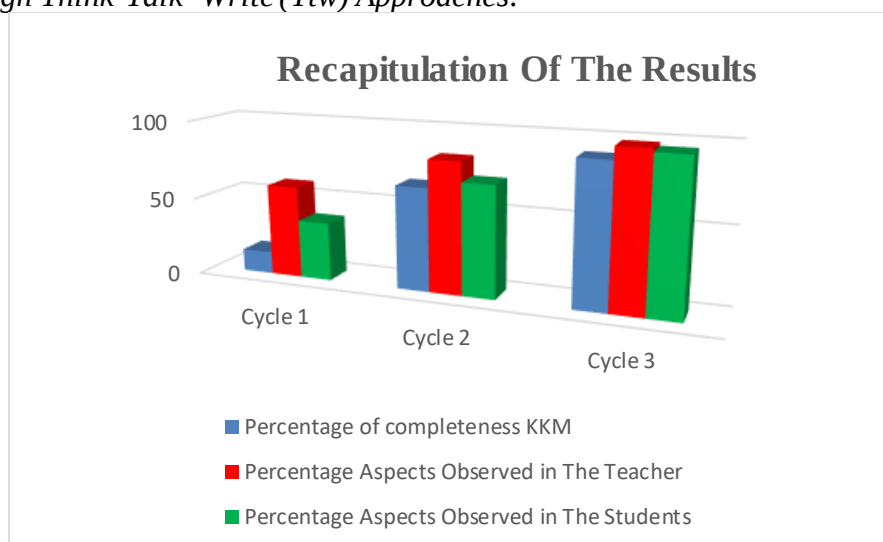


Figure 2. Observation of The Results

From Figure 2 the recapitulation of percentage results show that of cycle 1 to the completeness of the KKM value is 14.32%, observation of teachers 59.10%, observation of students 37.50%. In cycle 2 the percentage of completeness KKM value is 65.71%, observation of teachers 83.33%, observations of students 70.83%. While in cycle 3 there was an increase in the percentage of completeness KKM value of 90.13%, observation of teachers 97.91%, observations of students 95.82%. So in the skills of mathematical communication there is an increase for quadrilateral Bangun material in class VII A SMP Negeri 11 Cimahi from each cycle through the TTW (Think-Talk-Write) approach

Discussion

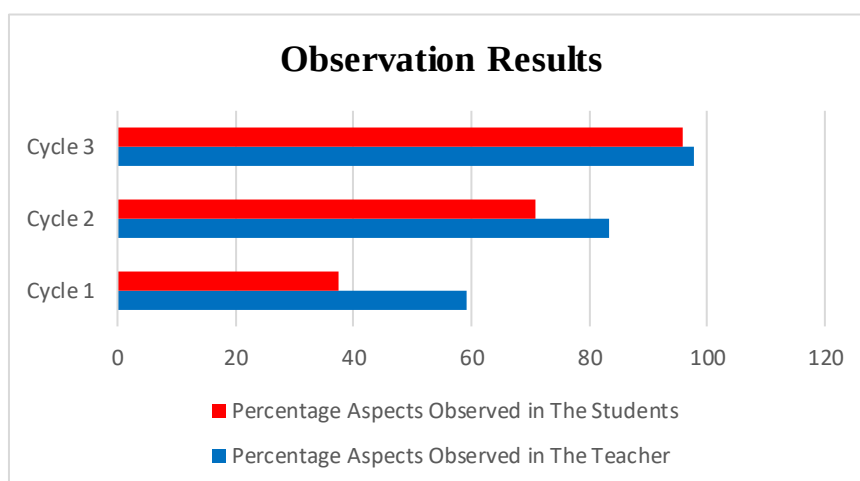


Figure 3. Observation Of Student And Teacher Activities Towards Mastery Learning

Table 2. Recapitulation of Learning Completeness Scenarios

Results	Σ Completeness of Teacher Learning Scenarios	Σ Completeness of Students Learning Scenarios
Cycle I	59,10%	37,50%
Cycle II	83,33%	70,83%

Cycle II	97,91%	95,83%
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Based on Figure 3 and Table 2 there is an increase in the achievement of KKM values, observations of teachers, and observations of students. recapitulation of the results of CAR shows that the percentage cycle I to the completeness of observation of teachers 59.10%, observation of students 37.50 %. In cycle II it the percentage of completeness observation of teachers 83.33%, observations of students 70.83%. While in cycle III the percentage of completeness observation of teachers was increase at 97.91%, observations of students 95.83%. The results of student work for each cycle there is an increase in the students' looks more excited, enthusiastic, actively participating in group discussions. Through LKS students are more independent in finding the basic concepts of quadrilateral building. Learning is more varied through discussion assisted by peer tutors when the thinking aims to make time-efficient and efficient resulting in students being more disciplined with time. the use of student worksheets when working on story problems trains students' thinking analysis so that there is an increase in students' communication skills on the material quadrangle build this is evident in working on the question description of students' answers that many have answered correctly.

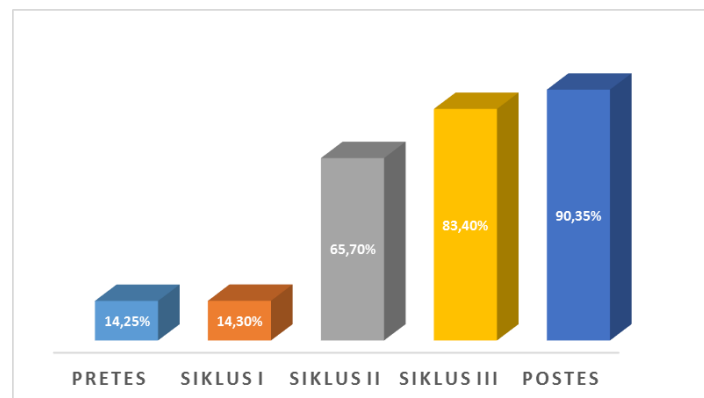


Figure 4. Recapitulation of Student Learning Outcomes Students



Figure 5. Learning and Teaching Activities in Classroom

In Figure 4 you can see a graph outcomes of student learning from the initial test (pretest) to the final test (posttest) continues to increase, the number of students who have learning outcomes and grades exceeds the specified KKM, so it can be said that student learning outcomes in the material Flat B Four experienced an increase in each stage. So that researchers and subject teachers agree to end the Cycle action to the Cycle III stage. Discussion Based on the description in the above research results, the application of the TTW (Think-Talk-Write) approach in helping improve students' skills of mathematical communication in the Quadrangle Flat material is quite optimal. This can be seen in the

implementation of the pretest, students who have grades above the KKM with of 14.25% are 5 students. At the first cycle stage with the completeness of the implementation of learning in teacher, activities is only 59.10% and 37,50% of the activities of student implementation of learning is still far from optimal, but student learning outcomes have increased very little from 14.25 %% to 14.30% which students who have a value above the KKM remain 5 peoples because the percentage of achievement both in terms of the implementation of learning and student learning outcomes are not on target, the research continues to the next stage, namely the implementation of the second cycle. In the second cycle implementation, the achievement of the implementation of learning by the plan of learning implementation in terms of teacher activity reached 83,33% and student activity reached 70,83%, it can be said that in this second cycle the learning using TTW (Think-Talk-Write) approach is almost close to optimal, this can also be seen from the grades achieved by students who have a value above the KKM increased to 65.70% are as many as 24 students. This shows students who have grades above KKM increased from 5 students to 24 students.

However, because the results did not meet the expected target, the researchers and teachers agreed to continue the third cycle. In cycle III the achievement of the implementation of learning by the plan of implementation of learning in terms of teacher activity reached 97.91% and student activity reached 90.1%, so it can be said that in this cycle III the implementation of learning using the TTW (Think-Talk-Write) approach has achieved the target to the maximum, this can also be seen from the value achieved by students who have a value above the KKM increased to 90.1% is as many as 33 students. In the next stage, namely the implementation of the posttest, where there were 34 students succeeded in having a score above the KKM with a percentage of 90.35%, this shows that the indicators of success in terms of student learning outcomes have been achieved. From the description above, where the completeness of the implementation of learning by the plan of implementation of learning and the achievement of student learning outcomes achieve indicators of research success, it can be concluded that learning mathematics using the TTW (Think-Talk-Write) approach can improve the skills of mathematical communication of junior high school students on the material Build Flat Quadrangle.

CONCLUSION.

Based on description in the results and discussion, it can be concluded that the ability of mathematical communication of the quadrilateral Flat Build material in grade VII A students of Junior High School 11 Cimahi state can be improved through the TTW (Think-Talk-Write) approach. This conclusion is based on the results of the posttest and more students who are creative and actively interact with other students or teachers during the learning process.

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