

CHAPTER I

INTRODUCTION

1.1. Background

All countries in the world have always prioritize education. Efforts to improve the quality of education that has been done by the government including curriculum renewal, improvement of educational facilities, the use of teaching methods and to improve the quality and quantity of teaching materials. Mathematics is one of the subjects that are used as a reference for educational advancement of a country. If a country has people who follow or win an Olympic mathematics, it is considered the country's education began to advance this is in line with the view that education is a benchmark of the progress of a country

Mathematics courses is given from grade 1 in elementary school, an early attempt to instill concepts, facts or principles of mathematics, which in turn is expect to improve the quality and quantity of learning outcomes in other education purposes. As written in the book *Materi Pelatihan Integrasi Buku-1* (2004: 7), that mathematics is abstract and deductive science. Mathematics is the study of patterns, shapes, and structures and mathematics is a human activity, also written on this book (2004: 4) that mathematics as a vehicle for education, not only can be used to achieve one goal such as to educate students, but can also form the personality of students and develop certain skills.

There are purposes of learning mathematics for student that under mentioned in *Materi Pelatihan Integrasi Buku-1* (2004: 24) are:

“(1) memahami konsep matematika. Menjelaskan keterkaitan antar konsep dan mengaplikan konsep atau algoritma, secara luwes, akurat, efisien dan tepat dalam pemecahan masalah, (2) menggunakan penalaran pada pola dan sifat, melakukan manipulasi matematika dalam membuat generalisasi, menyusun bukti, atau menjelaskan gagasan dan pernyataan matematika,

(3) memecahkan masalah yang meliputi kemampuan memahami masalah, merancang model matematika, menyelesaikan model dan menafsirkan solusi yang diperoleh, (4) mengkomunikasikan gagasan dengan simbol, tabel, diagram atau media lain untuk memperjelas keadaan dan masalah, (5) memiliki sikap menghargai matematika dalam kehidupan, yaitu memiliki rasa ingin tahu, perhatian, dan minat dalam mempelajari matematika serta sikap ulet dan percaya diri dalam pemecahan masalah”.

So, as said by book that published by Ministry of Education one purpose of learning mathematics is communicate ideas with symbols, tables, diagrams or other media to clarify the situation and problems. It's clearly showing that the ability if mathematics communication is also needed. Written in book published by Ministry of Education (2004: 8) in the early stages mathematics formed from human experience in the world of empirical ratios are then processed in the world, processed in the analysis and synthesis of the reasoning in cognitive structure, thus arrive at mathematics concept. In order to others understand the concept form and easily also appropriately manipulated, then use the notation and terminology carefully universally agreed upon and is known as language mathematics. Also confirmed by Ansari (2012: 1) that mathematics is a tool that can clarify and simplify a condition or situation that is abstract into concrete ideas through language and mathematics idea as well as a generalization to easier to find the problem solving.

Lack of ability of mathematical communication can lead to a lack of understanding the mathematical concept or mathematical problem. Without having the mathematical communication ability students will experience a lack of information, data and also the fact that it can be used in solving mathematical problems. This day, in mathematics learning-teaching process, few teachers use the paradigm of transfer knowledge. Said by Ruseffendi in Ansari (2012: 2) the biggest part where learned by students in a school is not obtained through mathematical exploration, but through notification. In turn, students'

mathematical communication ability of students in solving mathematics problems is very unsatisfactory.

The statement above is agreed by Baroody (1993: 2-99) “For children, mathematics is essentially a second or foreign language. When instruction focuses on memorizing terms rather than communicating ideas, many find mathematics impenetrable. Children’s difficulties in learning the new language of mathematics are compounded when it is introduced too quickly”.

Thus, all the opinions clarified that ability of mathematics communication is one of fundamental capability. Said by Ansari (2012: 10) there are three indicators of ability mathematics communication that concern to be repaired are: (1) the ability of explaining mathematical problem into figure, (2) the ability of explaining problem situations by own words, and (3) the ability of stating mathematical problem into mathematical model and doing calculation.

In fact, based on preliminary observation conducted by researchers in SMP Negeri 3 Kisaran, the students aren’t able to answer. It clearly seen in student’s answer sheet that student’s mathematical communication ability is low. For example, problem number one: Write down every sentence below to be mathematical model by using x and y variable. (a) The result of multiple from two natural numbers 2 is 9, (b) Amount of Ikhsan and Bayu book is 11, while difference of their books are 1, (c) Circumference of a rectangular is 14m, when size of the length 3 feet longer than the width.

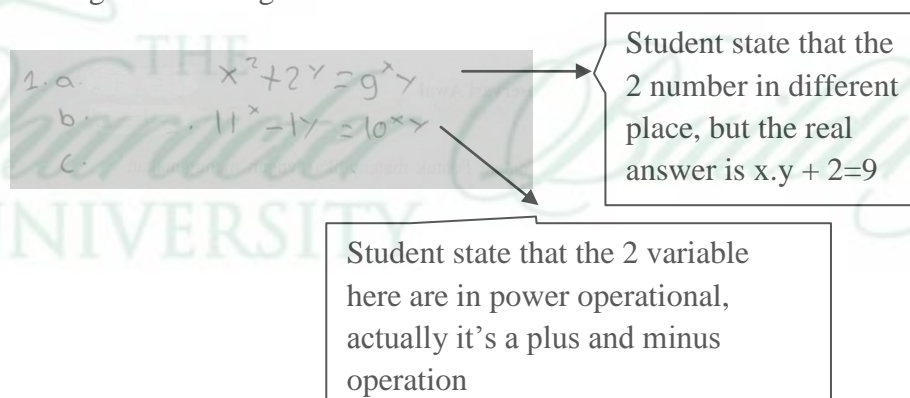


Figure 1.1 one of student answer to problem No. 1

For problem number one the indicator of mathematical communication ability is students able to state problem in writing into mathematical model (Ansari, 2012: 10). From the figure 1.1 above students can't form the mathematical model for the two natural number, also the sum and the difference of Ikhsan and Bayu book also they can form mathematical model from the circumstance of the rectangular. So from this first problem we found that student's ability in stating problem in writing in mathematical model is very low.

For the problem number two the indicator for the mathematical communication ability is explaining problem in writing into figure and stating problem in writing into mathematical model (Ansari, 2012: 10). The problem to test the indicator is: Indicate the $5\frac{1}{2}$ apples in picture form.

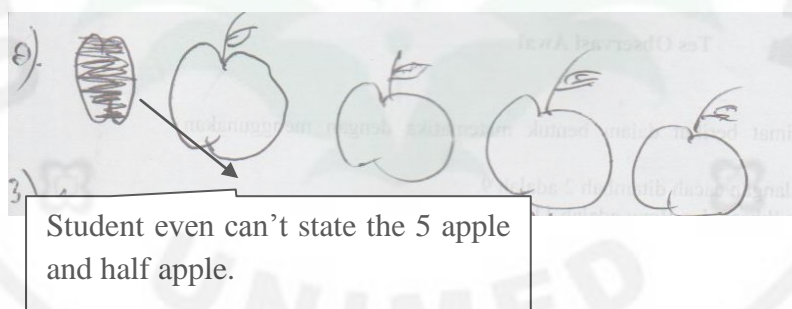


Figure 1.2 one of student answer to problem No. 2

From the picture above, it can be seen that the student is still difficult to determine half of the apple and the majority students are only focused to solve the problem half of the apple. Even partially other students are able to describe the half of apple properly. This indicates that the ability of mathematical communication in explaining problem and writing into figure is also weak.

The problem number three is: a company will deliver package to their 60 employees, which consists of 2 bottles of syrup and 12 cases of instant noodles. Then explain how dozen syrup and instant noodles are required by the company.

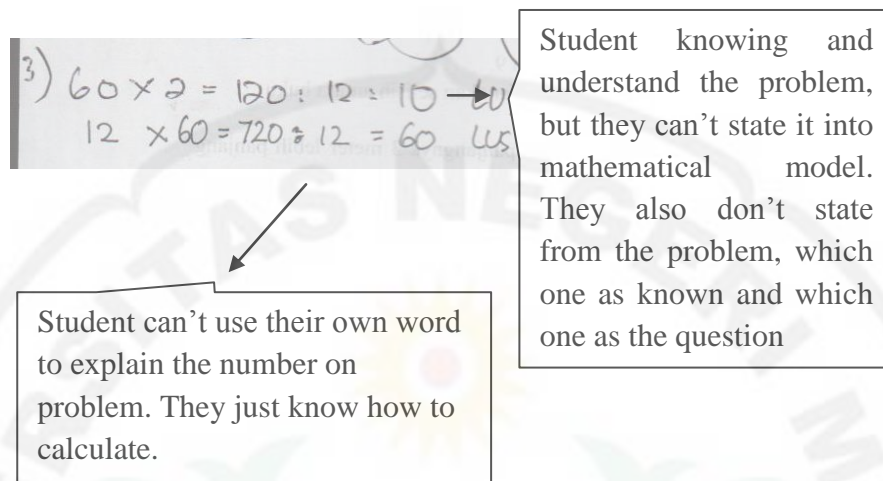


Figure 1.3 one of student answer to problem No. 3

The indicator of mathematical communication ability in problem number three stated by Ansari (2012:10) is explaining problem situations by own words and doing calculation. From figure 1.3 can be known that student can doing the calculation but they can explain clearly meaning of the number in their sheet. Also students make the syrup and instant noodle as one, even syrup and instant noodle are different type. Students also find it difficult to change the problem number three into a mathematical model, it means student's ability in explaining problem by own words and doing calculation us also weak.

From this preliminary observation, it can be concluded that the student's mathematical communication ability is still weak and unsatisfactory. This is also happen because student's lack of understanding of algebra and the system of linear equation. Besides that, their lack of mathematical communication ability because they not familiarized to change something abstract becomes real problem in form of mathematical model.

Lack of student's mathematical communication ability of SMP N 3 Kisaran is so relates with learning process which has done by the mathematics teacher. Teacher design the unsuitable learning model to increase students activity in the learning process.

Then, the next happen is the lack of reflect of the leaning mathematics itself. It's can also means the model that teacher use isn't suitable or need by students in terms to increase the student's activity in class.

As said by Paulo (in Agus, 2009: 13): teacher do the things, learners imagine how to act in accordance with his teacher action. It means that everything that teachers says it's true also teachers known everything when student's know nothing. Because teachers use this old paradigm of learning mathematics, the mathematical communication ability of students is decreasing. Teachers only transfer the knowledge that they know and students passively accept everything. This kind of learning behavior already used really long time in Indonesia learning process.

To fix it, is necessary to develop an approach to learning that is more effective, creative, and fun. On this basis, the authors try to apply cooperative learning model talking stick and see the difference with the use of cooperative learning cooperative script to improve the mathematical communication ability.

Learning model type talking stick has an aims to expand students' knowledge and accuracy in understanding a concept. As Agus (2009:109) said talking stick teaching methods encourage students to dare to express opinions. Agreed by Istarani (2012: 89) that talking sticks learning model, encourage students to dare to express their opinions, teachers give an explanation about the material, then students have time to read and write things they know after that the talking stick will be given to students and student that hold the stick must answer the question that teachers give.

Thus, cooperative learning type talking stick is an appropriate approach to develop student's mathematical communication through mathematical understanding which stimulated by the talking stick which going around the whole class to provide the opportunity for students to give their opinions.

According to Istarani (2012: 15) that model of learning in which students work in pairs and take turns verbally summarize, the parts of the material being studied. Cooperative learning model type cooperative script begins with the delivery of teaching materials that start with giving a discourse or a summary, then given an opportunity to the students to read it for a moment and provide, input or new ideas into teaching materials being studied.

So, cooperative learning type cooperative script also one of an alternative learning model that appropriate to develop the student's mathematical communication ability by give students opportunities to answer an also provide, input or new ideas in material that supplied.

Based on the background above, researcher intends to conduct a research entitled: **“The Differences of Students’ Mathematical Communication Ability Taught by Cooperative Learning Talking Stick and Cooperative Script Types at SMP Negeri 3 Kisaran”**

1.2. Problem Identification

Based on the analyzing in background, problem identification in this research are:

1. Student's mathematical communication ability is still low.
2. Student's activity in the learning process is passive.
3. The learning model that teacher use isn't suitable for students in terms to increase the student's activity in class.

1.3. Problem Formulation

The problem formulation in this research is:

1. Is there any difference student's in mathematical communication ability taught by cooperative learning talking stick type with cooperative script type?

2. Is student's answer sheet taught by cooperative learning talking stick type and cooperative script type has varieties answer?

1.4. Problem Limitation

This research bound the problem to get precise target expectation. The problem limitation is:

1. The model used is cooperative learning talking stick type and cooperative script type.
2. The student's mathematical communication ability bounded in quadrilateral matter in grade VII semester 2.
3. The research was concluded at SMP Negeri 3 Kisaran

1.5. The Objectives of Research

The objective in this research is:

1. To know any difference in student's mathematical communication ability taught by cooperative learning talking stick type and cooperative script type.
2. To see varieties of student's answer type taught by cooperative learning talking stick type and cooperative script type.

1.6. The Benefit of Research

1. For the teachers, especially mathematics teacher, this research can be consideration in selecting one of alternative model or approach in mathematics learning.
2. For the candidate of teacher, this research can be proper consideration for handle the problem which often appears in mathematics learning in school.
3. For the students, this research can make students have enthusiasm to improve their mathematical communication ability.

4. For the researcher, this research used for increase researcher's knowledge about problem in learning process and try to solving it.
5. For the school, this research can be consideration and suggestion to improve the quality of teacher also the learning activity at class

1.7. Operational Definition

Operational definition emphasize to things which will be standard or indicator of variable. Operational definition in this research is:

1. The indicator of student's mathematical communication ability which will be measured are:
 - a. The ability of explaining mathematical problem into figure.
 - b. The ability of explaining problem situations by own words.
 - c. The ability of stating mathematical problem in writing into mathematical model and doing calculation.
2. The syntax of Talking stick, are:
 - a. Phase 1: teachers prepare a stick
 - b. Phase 2: teachers deliver the subject matter to be studied then give the opportunity to students to read and learn the material.
 - c. Phase 3: after finishing read the material in their subject book and learning it, student's close their book
 - d. Phase 4: teachers take a stick and give to students, after that the teacher provides questions and learners who hold the stick must answer, so until all learners take part to answer all questions from the teacher
 - e. Phase 5: teachers and students to make conclusion
 - f. Phase 6: evaluation
 - g. Phase 7: closing

3. The syntax of cooperative script, are:

- a. Phase 1: Teachers divide students into couple.
- b. Phase 2: Teachers give a script about material to read and be summarized.
- c. Phase 3: Teachers and students make a decision student's going first as speaker and other student's going to be listener.
- d. Phase 4: Speaker read summarized as complete as possible, by inserting the key ideas in the summary. Other learners:
 - ✓ Listening and shows the main ideas incomplete
 - ✓ Helps to remember or memorize the key ideas with the previous material, or with any other material
- e. Phase 5: exchanging roles, originally a listener later became speaker, and vice versa
- f. Phase 6: did back phase 4
- g. Phase 7: teachers and learners together conclude the subject material.
- h. Phase 8: closing.