

CHAPTER I

INTRODUCTION

1.1 Background

Education is a very important aspect of human life because education can help humans in developing themselves to be able to deal with any changes that occur. Mathematics is a general science that underlies modern technology development, has an important role in various disciplines, and develops human thinking power.

Mathematics is an abstract science and is developed from general to specific with the truth of a concept and the previous truth being related. Mathematics is a subject that is not foreign to students. Since elementary school students have been introduced to mathematics. So far, mathematics has become a subject that is less attractive to students because most students have difficulty in mathematics (Ariantini, 2014: 56).

In learning mathematics, learning does not only require students to consider the material at the time, but also learn with understanding and actively developing new knowledge from previous experience and knowledge that the learning more meaningful. For this to be realized, the NTCM (2000) Plans five processes that students need through mathematics learning which are included in the standard process, namely: (1) Problem Solving, (2) Reasoning and Proof ,(3) Communication, (4) Connection; and (5) Representation.

Problem solving as a teaching method can be used to achieve an instructional role for learning basic facts, concepts and procedures, as well as goals for problem solving. Problem solving is a major part of mathematics and has many applications and often this application becomes an important problem in mathematics.

Problem solving ability is an important component in learning mathematics, through problem solving, students will have basic abilities that mean more than just thinking skills, and can make solving strategies for further problems. Problem solving can sharpen students' analytical and critical strengths.

Problem solving is not just a skill to be taught and used in mathematics but also a skill that will be brought to students' daily problems or decision-making situations, thus problem-solving abilities can help someone in his life.

However, in reality there are still many students who have problems in learning mathematics. One of them is the lack of ability to solve problems. Lack of problem-solving skills will result in poor learning outcomes. One of the causes of the low ability of students in solving problem solving problems, among others, is because the learning that is built in the classroom is not directed at honing problem solving skills. Good learning planning will at least contribute to the teaching and learning process in the classroom, but in reality the teacher is less than optimal in making lesson plans so that the learning process runs as low as possible.

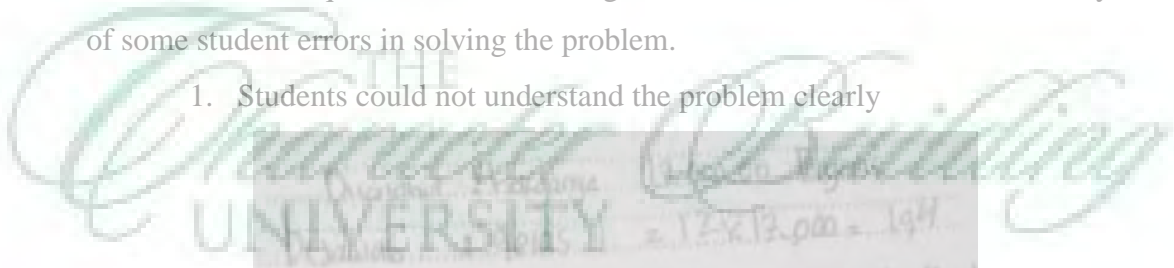
Based on an initial observation conducted by researcher at the grade VIII SMPN 4 Medan, it showed that students still have difficulty in solving mathematics problems.

Problem:

Sisi bought a dozen glasses at a price of Rp 17.000 per glass. Then she bought 19 more glasses at a price of Rp 34.000 per glass. How much money must be paid for the glasses? Is it enough if Sisi pays Rp 1.000.000? why and why not? Give your explanation

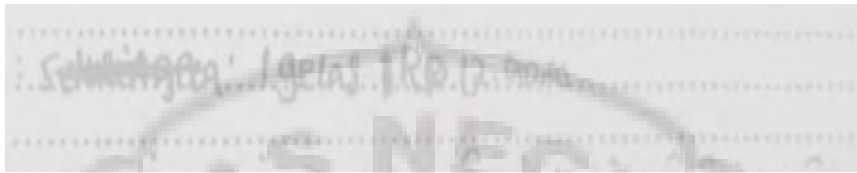
From this question, the following are the results of the work and analysis of some student errors in solving the problem.

1. Students could not understand the problem clearly



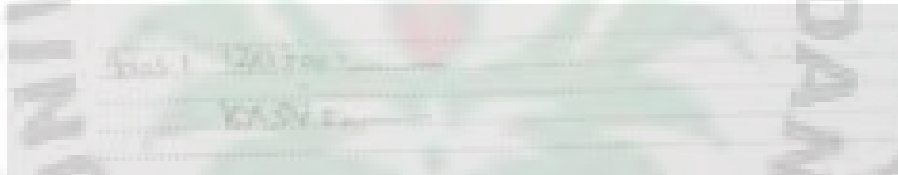
From this figure shows that most students did not understand the problems mentioned above. Students were almost able to identify what is known but not clearly. Also they were not able to identify what is asked. In this step, there are 18 out of 32 students could not understand the problem clearly.

2. Students could not devise the problem a plan in problem solving strategy



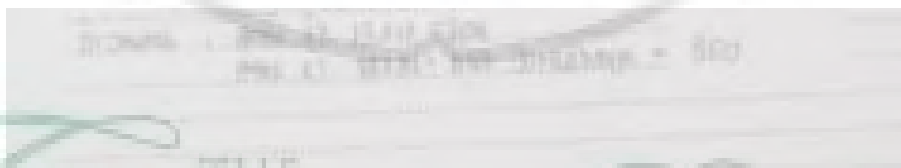
From this figure shows that students did not know the first step must be done to solve the problem. It happened because they did not understand the problem clearly. In this step, there are 16 out of 32 students could not able to find the connection between data that given and the asked not write models write mathematical models correctly.

3. Students could not carry out the plan in problem solving strategy



From figure shows that students could not carry out the problem based on the plan that has been and also they didn't do the step of the solution clearly. Students could not do the right strategy to solve problems. In this step, there are 20 out 32 students could not able to implement the problem-solving strategy

4. Students did not look back the solution carefully



From the figure shows that students did not check back their task carefully. They also could not write the calculation this step, there are 25 out of 32 students did not do looking back.

From the diagnostic test of problem-solving ability above, many students still cannot understand the problem, make the question into mathematics model and solving the problem exactly. The result can be explained as follows:

- The first indicator is understanding the problem. there are 43.75% students have been understood the problem well and 56.25% of students

have not been understood the problem or the condition that presented by the problem.

- The second indicator is devising a plan there are 50% of students have devised a plan and 50 % of students have not been devised a plan to solve the problem.
- The third indicator is carrying out a plan, there are 37.5% of students have been carried out the plan and 62.5% of students have not been carried out the plan and could not see clearly that be step is correct
- The fourth indicator is looking back, there are 21.875% of students have been looked back carefully and 78.125% of students have not been looked back.

Based on the results of observations, observations and interviews conducted by researchers with class teachers in class VIII-6, Mr. Hadi Ismanto Walesa Panjaitan, S.Pd at SMP Negeri 4 Medan on February 8, 2022 he said that "there were several problems from class VIII- 6, the most prominent problem is the low value of student learning outcomes in several subjects, and the lowest is mathematics in class VIII-6 ". This is because teachers are still using conventional and monotonous learning models, lack of student concentration, there are still many students who are busy alone or chatting when learning takes place, so that many students' scores are low and do not reach the KKM for mathematics that has been determined, which is 65.

This is in line with the results of the diagnostic tests given to students of class VIII-6 SMP N 4 Medan, where the tests given to students are in the form of a diagnostic test of mathematical problem-solving abilities. Based on the results of these observations, it was concluded that the mathematical problem-solving ability of students in class VIII-6 N 4 Medan was still low. The results obtained are that there are 14.8% of students who score in the high category, 66.6% of students who score in the middle category, 18.5% of students who score in the low category. So it can be concluded that the mathematical problem solving ability of the students of SMP N 4 Medan is low.

One of the learning models considered by researchers to motivate students in improving their mathematical problem-solving ability is the Missouri Mathematics Project (MMP) learning model. Missouri Mathematics Project (MMP) learning model demands student activity in learning because the teacher is only a facilitator who accompanies and only helps students find their knowledge". The Missouri Mathematics Project (MMP) learning model trains students to be independent, collaborative, and think creatively in solving math problems.

The Missouri Mathematics Project (MMP) learning model is a structured learning model consisting of 5 steps, namely review, development, cooperative work (controlled exercise), seatwork (independent work) and assignment (PR). With the elements of cooperative work and seatwork in this model, it is hoped that students can practice solving problems more both independently and in groups so that the difficulties faced by students can be minimized and students can be more skilled in working on problems independently.

In addition, this MMP model is considered suitable to help students improve problem solving skills. This is because each stage in this model is very helpful for students to solve problems. In the review step, students are given material that has been studied previously related to the material to be taught, so that they can explore and remind the prerequisite material. In the development step, students are given an expansion of the material by presenting new ideas and expanding concepts. After being given the material in the review and development step, then students are divided into several groups to solve the problems/problems given. In this step students can exchange ideas to find solutions to problems and are also given the opportunity to ask questions. Then in the seatwork step (self-employed), students are given another problem and do it independently, not in groups, this is to train students' independence in solving problems. And so that students are more skilled in solving problems students are given homework.

Based on the background and the entire study, the authors believe that the Missouri Mathematics Project (MMP) model can also be used to improve students' mathematical problem-solving abilities. Therefore, the authors are

interested in conducting research on. **"Improving Student's Mathematical Problem-Solving Ability by Using Missouri Mathematics Project at SMP Negeri 4 Medan."**

1.2 Problem Identification

Based on the background above, the problems of this research is:

1. Students' mathematical problem-solving students' ability still low
2. Student's mathematics learning outcomes are still low
3. Students' find many difficulties to understand the subject matter and problem given
4. Students are less active in participating in mathematics learning
5. The Missouri Mathematics Project model is rare to be applied in the learning process at SMP Negeri 4 Medan.

1.3 Problem Limitation

Because problem of research are breadth and lack of expertise and time, then the researcher need to limit problem. The limit problem studied is the improving students' mathematical problem-solving ability by using Missouri Mathematics Project in SMP Negeri 4 Medan.

1.4 Problem Formulation

Based on the above problem limitation, then the problem formulation in this research: Is the Missouri Mathematics Project (MMP) model to improve students' mathematical problem-solving ability in VIII-6 grade at SMP N 4 Medan T.A 2022/2023?

1.5 Research Objective

The purpose of this study is: To improve problem-solving ability through the Missouri Mathematics Project (MMP) model of VIII-6 grade at SMP Negeri 4 Medan TA 2022/2023.

1.6 Research Benefit

The research is expected to provide the following benefits:

1. For students, the application of learning is expected to increase understanding of concepts, improve students' mathematical problem-solving abilities, encourage students to enjoy mathematics so that they can grow motivation to learn mathematics and can play an active role in constructing their own knowledge so that they can train and develop students' mathematical power.
2. For researchers, add scientific insight and contribute ideas about a more effective, creative and fun mathematics learning model as well as provision for the future as prospective educators.
3. For teachers, it is easier for teachers to carry out the learning process because feedback from students is fast. Teachers gain experience in designing and implementing the Missouri Mathematics Project (MMP) learning model. It is expected that teachers can develop varied models, approaches, strategies in order to improve the quality of learning.
4. For schools, as input in determining policies that can help improve students' mathematical problem-solving abilities.

1.7 Operational definition

The operational definitions in this study are:

1. The Missouri Mathematics Project (MMP) learning model is a model designed to help teachers in terms of the effectiveness of using exercises so that students are accustomed to solving math problems. The Missouri Mathematics Project (MMP) learning model trains students to be independent, cooperative, and think creatively in solving math problems. The Missouri Mathematics Project (MMP) learning model has steps in its implementation, namely, review, development, group/cooperative work, seatwork, and homework.
2. Students' mathematical problem-solving ability is the ability to think that must be developed in a person in order to solve a problem in

mathematics with a critical and creative thinking process. The ability to solve in terms of aspects:

a. Understanding the problem

In this case, understanding the problem is that students can identify what information (data) is known, what is being asked, and the adequacy of the information provided.

b. Devising a plan

In this case planning the problem means that students are able to develop mathematical models and formulate problems in mathematical form.

c. Carrying out the plan

In this case students bring up various possibilities or alternative ways of solving, formulas and knowledge that can be used in solving these problems.

d. Looking back

Re-checking, namely students are able to explain the answers obtained and re-examine the answers, and match the answers that have been obtained with what was asked