

CHAPTER I

PRELIMINARY

1.1 Background

Education has an prominent role in improving the quality of human resources. Education is a form of manifestation of human culture that is dynamic and full of development. Education that is able to support future development is education that is able to develop the potential of students. In formal education we are required to master some of the material being taught, one of which is learning mathematics. Mathematics is one of the most important branches of science. NCTM (2000) states that mathematics is not just a collection of separate topics and abilities, but mathematics is an integrated field of study despite the fact that mathematics is often taught in various fields.

Hobri (2009) states that as a basic science, mathematics plays a very prominent role in the expanded of science and technology, because mathematics is a thinking tool that develops reasoning, logical, systematic and critical thinking. One of the basic subjects that are the foundation for mastering other exact sciences is mathematics. Mathematics has a meaning for students to train their attitudes and skills. Apart from being a means of thinking mathematics, it also instills skills such as accuracy, precision and accuracy. These three elements are very important elements in the development of science and technology. To master and create technology in the future requires strong mastery of mathematics from an early age, so that it can be said that mathematics is the foundation for mastering science and technology.

According to Berch & Mazzocco (in Uno & Kuadrat, 2009) "Students need to learn mathematics because of its importance in everyday life". Cockroft argued about why mathematics is taught. This is because mathematics is very necessary and beneficial in everyday life, science, business and industry, because

mathematics is really a powerful, concise and unambiguous communication tool and works as a means of description and prediction.

Mathematics is one of the subjects that occupy an important role in the world of education, but in reality the results of students' mathematics learning are still very low. In PISA 2018, in the field of mathematics, Indonesia is in 7th position from the bottom with an average score of only 379, still far from the OECD average score, which are 487. This shows that the literacy and mathematics abilities of Indonesian children are very far behind compared to children in other countries.

Attalah, Sharon, & Robin stated "Mathematics is generally disliked because it is seen as a difficult and boring subject". So many students experience difficulties in learning mathematics, especially in understanding concepts which are basic understanding. (in Sari & Surya, 2017). In the process of learning mathematics, many students do not like mathematics, because it is considered a subject that is difficult to understand, and many students really hate mathematics because it deals with calculations. There are many assumptions that mathematics is a difficult subject, it could be because students do not understand the concept of the mathematical material being studied. Understanding the concept is the basis for understanding mathematical material, one concept and another concept are interrelated, so students must first understand the concept so that they can understand the material and complete and solve various kinds of problems. (Siagian dkk, 2019).

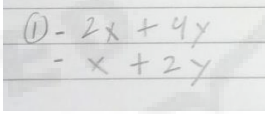
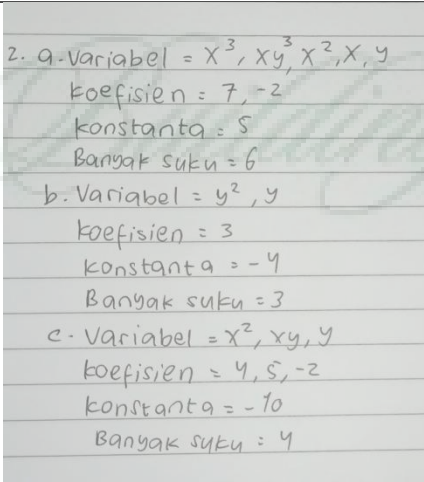
Based on Permendikbud Number 58 of 2014 it is stated that one of the objectives of learning mathematics is for students to be able to understand mathematical concepts. The materials taught to students are not as memorization, but as a goal to achieve the expected concepts in the learning process objectives. So that students can understand something based on their learning experience (Suhendar, Narlan 2014). The ability to understand mathematical concepts is needed to master teaching materials that contain many formulas so that students can understand the concepts in the material as a whole and are skilled at using

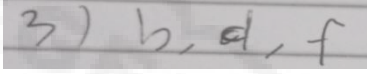
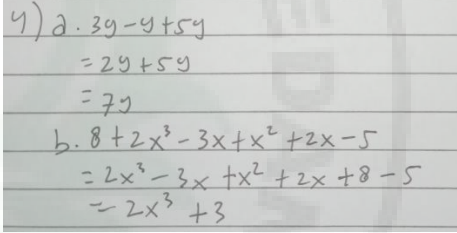
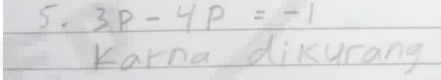
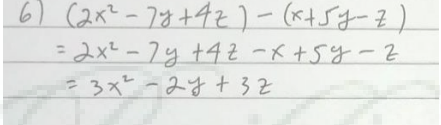
various procedures in it flexibly, accurately, efficiently and precisely (Dini et al, 2018).

Kilpatrick, Jeremy, and Findell (2001) state that conceptual understanding is an ability related to understanding comprehensive and functional mathematical ideas. Therefore, understanding the concept becomes a fundamental part of building mathematical knowledge. When students have a strong and correct understanding of concepts, this will become a provision for studying mathematics at a higher education level. In every mathematics learning, the emphasis should be on mastering concepts so students have a good foundation of concepts to achieve other basic abilities such as reasoning, communication, connections and problem solving.

Based on observations made at SMP Negeri 1 Air Putih, it is known that there are still many students who have troublesome in understanding mathematical concepts. This can be seen from the answers of students who do not meet the indicators of conceptual understanding.

Table 1.1 Analysis of Student's Wrong Answer in Diagnostic Test

Question	Indicator	Students' Answer
Make 2 algebraic forms which are two terms and their explanations!	Restating a concept	 <p>students have been able to answer questions but students have not been able to provide reasons for the answers given</p>
State which includes variables, coefficients, constants and how many terms there are in the following algebraic forms: a) $7x^3 + xy^3 - 2x^2 + x - y + 5$ b) $3y^2 + 3y - 4$ c) $4x^2 + 5xy - 2y - 10$	Classify objects according to certain according to the concept	 <p>students have been able to classify</p>

		variables, coefficients, constants, and many terms, but there are still errors, such as in this answer the students do not enter the number 1 as the constant because it is not written in the problem
Which of the following algebraic forms has 3 terms? and give reasons! a) $x^3 + xy - 6y + 8y - 3$ b) $x^2 + 8x - 2x^3$ c) $y^2 - 2xy + 2y - 12$ d) $2a^2 + 6b - 7$ e) $x^2 + 2x - xy + 5$ f) $2p + q + 15$	Provide examples and non-examples of a concept	 students have been able to answer questions but students have not been able to provide reasons for the answers given
Simplify the following algebraic expression: a) $3y - y + 5y$ b) $8 + 2x^3 - 3x + x^2 + 2x - 5$	Presenting concepts in various forms of representation	 students can answer the questions in part a but are confused when doing part b which is because the variables have exponents
Three people simplify $3p - 4p$. Each results is $-1, -p, -1p$. Write which one is most appropriate and explain your reasons!	Develop necessary or sufficient requirement of a concept	 . Based on these answers students not been able to develop necessary or sufficient requirement of a concept
$(2x^2 - 7y + 4z) - (x + 5y - z) = \dots$	Using and utilizing and selecting certain procedures or operations	 The student's answer was wrong because the student added up the variable x which was raised to the power of two with the variable x which was raised to the first power. Based on these answers students have been able discover the procedures but there are still errors in the process.
Mr. Tohir has a square of land with sides $(10 - x)m$. On that land he will make a fish pond in the shape of a square with	Applying concepts or algorithms in problem solving	There were no students who can answer this question. This shows that students have not been able to Applying concepts or algorithms in problem solving

sides $(8 - x)m$. If he has $28 m^2$ of land left, then the area of Pak Tohir's land is...		
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Based on the diagnostic tests conducted, there were 49,22% of students who answered correctly for the restating a concept indicator, 74,22% of students who answered correctly for the classify objects according to certain according to the concept indicator, 39,06% for the provide examples and non-examples indicators of a concept, 48,44% for presenting concepts in various forms of representation indicator, 51,56% for develop necessary or sufficient requirements of a concept indicator, 32,81% for using and utilizing and selecting certain procedures or operations indicator, while for applying concepts or algorithms in problem solving indicators there were no students can answer these questions.

From the observations was made it is also seen that the teacher uses a teacher-centered learning method, namely the lecture method so that students do not get the opportunity to develop their own abilities. Students only pay attention, listen to the teacher's explanation, then take notes, memorize and work on the questions given by the teacher so that students do not understand the concept of the material being taught.

According to Hasbullah and Wiratomo (2015) a learning model is a form of illustrated learning from start to finish, usually presented by a teacher. In other words, a learning model is a framework or framework for implementing an approach, method, learning technique. One of learning model that is expected to improve students' understanding of mathematical concepts is the Missouri Mathematics Project (MMP) learning model. The Missouri Mathematics Project is a mathematics learning model implemented in Missouri, a state of the United States under the Missouri Department of Elementary and Secondary Education. Isrok'atun and Rosmala (2018) state that the MMP learning model is a mathematics learning model that facilitates students with project assignment sheets in the form of a series of questions or orders to develop an idea or concept obtained.

The Missouri Mathematics Project (MMP) learning model is a model designed to help teachers make their classes effective. This learning model is also

an innovative model in learning mathematics which is designed to assist students in developing various mathematical skills, especially increasing understanding of concepts optimally. The MMP learning syntax consists of five stages, namely: (1) introduction/review; (2) development; (3) controlled exercise; (4) seatwork/self-employment; and (5) assignment or homework (PR).

The characteristics of the Missouri Mathematics Project (MMP) learning model are practice questions. These exercises are a task that asks students to produce something (a new concept) from themselves (students). The advantages of the Missouri Mathematics Project (MMP) learning model are the many exercises and repetitions given. Through the Missouri Mathematics Project (MMP) learning model, students are given the opportunity to develop their ability to understand concepts through exercises both in groups and individually.

Previous research related to the Missouri Mathematics Project (MMP) learning model conducted by Ni Pande Kadek Ayu Pratiwi, I Wayan Puja Astawa and Gusti Ayu Mahayukti in 2019 where the average percentage of students' ability to understand mathematical concept tests in the experimental class (using the learning model MMP) of 78.97%, while in the control class (using conventional learning models) of 71.66%.

Rina Anggraini, Citra Utami and Rika Wahyuni (2020) stated that there were differences in the increased ability to understand mathematical concepts between students who were given MMP model learning and students who were given direct learning, the MMP model implemented very well in learning mathematics with a percentage of 72% for the first meeting and 89% for the second meeting, student learning activities in the MMP learning model have two behaviors for the first meeting active student behavior with a percentage of 78.01% and 22% passive student behavior, for the second meeting active student behavior with a percentage of 93.74% and 8, 21% passive student behavior, as well as positive student responses to the MMP learning model with a percentage of 69.83%.

In connection with the description of the background and problems above, the writer intends to conduct research on: The Efforts to Improve Student's

Ability in Understanding Mathematical Concept with Missouri Mathematic Project Learning Model in Grade VIII of SMP Negeri 1 Air Putih.

1.2 Identification of Problems

Based on the background of the problems that have been stated, the researcher can identify the following problems:

1. Lack of students' ability in understanding mathematical concepts
2. Students assuming that mathematics is difficult
3. Students do not get the opportunity to develop their own abilities
4. Students are not interested in learning mathematics because students do not understand
5. Variations in the use of learning models used are still lacking

1.3 Problem Limitation

Based on problem identification that have been stated above, the limitations of this study are:

1. Lack of students' ability in understanding mathematical concepts
2. Variations in the use of learning models used are still lacking. The learning model that will be carried out in this research is Missouri Mathematics Project learning model.
3. This research will be conducted in VIII grade of SMP Negeri 1 Air Putih T.A 2022/2023

1.4 Formulation of the Problem

Based on the limitations of the problems that have been stated above, a research problem can be formulated, that is:

1. How the improvement of students' ability in understanding mathematical concepts using the Missouri Mathematics Project learning model in class VIII students of SMP Negeri 1 Air Putih T.A 2022/2023?

2. How is the classical completeness of class VIII students of SMP Negeri 1 Air Putih in learning statistics using the Missouri Mathematics Project learning model?

1.5 Research Objectives

The research objective of this study was:

1. Describing the improvement of students' ability in understanding mathematical concepts using the Missouri Mathematics Project learning model in class VIII students of SMP Negeri 1 Air Putih T.A 2022/2023
2. Describing the classical completeness of class VIII students of SMP Negeri 1 Air Putih in learning statistics using the Missouri Mathematics Project learning model

1.6 Benefits of Research

The results of this study are supposed to provide the following benefits:

1. For researchers, as a learning tool to gain knowledge and skills, especially regarding the Missouri Mathematics Project (MMP) Learning Model.
2. For students, it can improve the ability to understand mathematical concepts, especially in Statistics material.
3. For teachers, as an alternative teaching method
4. For schools, to obtain ideas for efforts to improve the quality of their learning.