CHAPTER I
INTRODUCTION

1.1 Background of Study

Mathematics is a subject that always exists at every level of education. Mathematics lessons play an important role in all aspects of life. Kline (in Susilawati, 2015) states that mathematics is not an isolated knowledge that can be perfect on its own, but the existence of mathematics is primarily to assist humans in understanding and mastering social, economic, and natural problems. Therefore, the development of mathematics never stops because it will continue to be needed in various aspects of human life.

Although knowledge of mathematics is needed in life, in reality, there are still many students who do not like mathematics. Mathematics is considered a tedious, complex, and scary subject. Many students do not have the motivation to learn and lack understanding in mathematics. As said by Santrock (2017) Motivation is an essential aspect of teaching and learning. Students who do not have motivation will not try hard to study. Highly motivated students enjoy going to school and absorbing the learning process.

Learning motivation is important for students and teachers. For students the importance of learning motivation is as follows: (1) Make awareness of the position at the beginning of learning, process, and final results. (2) Inform about the strength of the learning effort compared with peers. (3) Directing learning activities. (4) Enhancing the spirit of learning. (5) Awareness about the continuous learning journey and then work (among which is rest or play). If the perpetrator realizes the motivation, then a job, in this case, the learning task, will be completed properly (Dimyati & Mudjiono, 2010).

Motivation can arise in a person if there is stimulation from the outside even though motivation comes from within, which can be seen in the form of activity. In the learning process, one of the teacher's most important roles is to make efforts and

create conditions that direct students to read well. Teachers need to pay attention to attitudes that can encourage students to actively learn seriously (Kompri, 2016).

In line with the statement said by William Burton (in Hamalik, 2017) that:

"Individuals are motivated by purposes and goals which make sense to those individuals motivating then becomes the subtle of seizing upon natural purposes already existing, within the on going activities of the learnes, or setting the stage, manipulating the environment so that purposes meaningful to the learner."

Motivation is seen as a mental drive that drives and directs human behavior, including learning behavior. Learning motivation in students can be weak, weak motivation or lack of motivation to learn will weaken learning activities. This will have an impact on the lack of understanding of students in learning (Dimyati & Mudjiono, 2010).

Henderson & Dweck (in Santrock, 2017) state that youth can be a significant transition period in achievement and social motivation. Academic and social pressure forces adolescents to take on new roles requiring greater responsibility. Once adolescents experience stronger pressures to achieve, their social interests may be somewhat neglected as they focus more on academic matters. This shows that students at the junior high school level should have high learning motivation.

According to Robert M. Gagne (in Nurdyansyah & Fahyui, 2016) there are eight phases of the learning process, namely:

1. **Motivation**, the initial phase starts learning with the encouragement to take action in achieving specific goals (intrinsic and extrinsic motivation).
2. **Understanding**, individuals receive and understand the information obtained from learning. Understanding is gained through attention.
3. **Acquisition**, the individual gives meaning / perceives all the information that reaches him so that the storage process occurs in the student's memory.
4. **Withholding**, withholding information/learning outcomes so that they can be used for the long term. Long-term memory process.

5. **Recall**, re-issue information that has been stored, when there is stimulation.
6. **Generalization**, using learning outcomes for specific purposes.
7. **Treatment**, the embodiment of changes in individual behavior resulting from learning.
8. **Feedback**, individuals get feedback from the behavior that has been done.

Based on the explanation explained by Robert M. Gagne, learning mathematics needs to be based on motivation and also a good understanding of concepts. Meanwhile, according to NCTM (National Council of Teachers of Mathematics, 2000) understanding concepts is the primary basis for learning mathematics. In line with Santrock (2017) statement in his book entitled educational psychology, namely conceptual understanding is a key aspect of learning. One of the important goals of teaching is to help students understand the main concepts in a subject, not just memorize isolated facts.

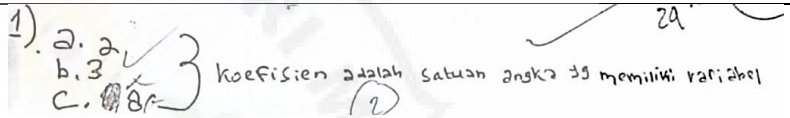
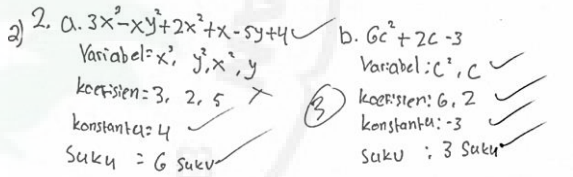
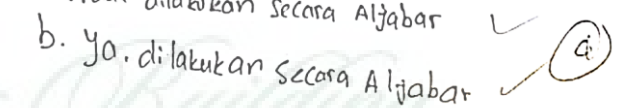
Mathematical understanding is more meaningful if it is built by the students themselves. To achieve a meaningful understanding, learning mathematics must be directed at the ability to connect mathematics between various ideas, understand how mathematical ideas are related to one another so that a thorough understanding is built, and use mathematics in contexts outside of mathematics. Therefore, the ability to understand mathematical concepts is essential for students in learning mathematics. The material studied in mathematics is essential so students need special attention, high learning motivation and a good understanding of mathematical concepts to master. This shows that students at the junior high school level should have good ability to understand mathematical concepts.

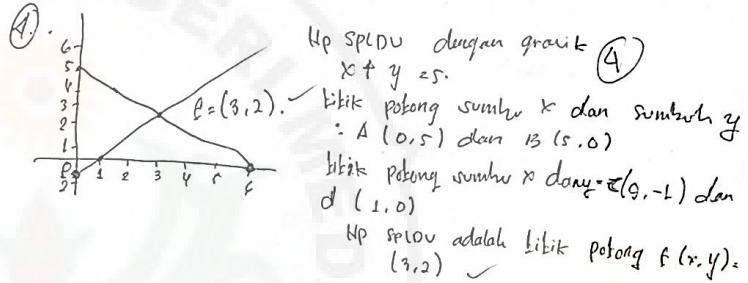
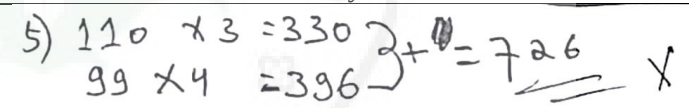
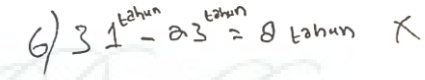
But in reality, based on interviews from several mathematics teachers at MTs Negeri 2 Rantauprapat, it was stated that there were still many students who had difficulty working on math problems and did not follow the learning process. This is indicated by a lack of student attention to learning activities and a lack of motivation to learn so it is difficult to work on the questions because they do not understand the questions given by the teacher. In addition, the learning method used is still monotonous, namely the expository method, where the expository method is

a learning strategy that emphasizes the process of delivering material verbally from a teacher to students. Thus, making students easily bored and not concentrate anymore. This has an impact on students' low ability to understand mathematical concepts, as seen from the following symptoms; some students are less able to understand and solve questions, some students are lazy to work on questions because they think mathematics is complicated and tedious, and students tend to be lazy to participate in question-and-answer activities. Apart from that, from what I have observed, the condition of the school environment, such as facilities and infrastructure, are still not sufficient to facilitate all students at school. like textbooks that are still shared.

The results of observations of MTs Negeri 2 Rantauprapat students from the initial tests carried out are as follows, The 32 students in class VIII-A MTs Negeri 2 Rantauprapat who had filled out the motivational questionnaire, it was found that based on the results of the analysis 32 students had a level of motivation that was classified as Enough. Then the average percentage of motivation results obtained, namely 55.98%, is classified as Enough according to Criteria for percentage of learning motivation adopted by Arikunto (2018). With each percentage per indicator, namely first indicator there is desire and urge to succeed is 55,10%, Second indicator there is encouragement and need in learning is 60%, third indicator there are hopes and aspirations for the future is 56,60%, fourth indicator there is appreciation in learning is 53,44%, fifth indicator there are interesting activities in learning is 55,10%, and sixth indicator there is a conductive learning environtment, so that it allows a student to study well is 55,20%.

Table 1.1. Diagnostic test results for understanding students' mathematical concepts.

No	Question	Student Answers
1	Explain what is meant by a coefficient in an algebraic form! Then find the coefficient y of the algebraic forms below! a. $2y + x - 6x^2 - 10y^2$ b. $x^3 + x^2y + 5xy^2 - 3y$ c. $5(4y^2 - y) + 8y(2 - y)$	 Students have been able to restate the concepts they have learned even though they are not precise.This can be seen from the students who have answered everything according to what was asked in the question but the answers are still wrong.
2	Try to write down which variables, coefficients, constants and how many terms there are in the following algebraic forms! a. $3x^3-xy^2+2x^2+x-5y+4$ b. $6c^2+2c-3$	 Students have been able to mention what are the properties according to the concept but not yet precise.This can be seen from the students who have answered everything according to what was asked in the question but the answers are still wrong.
3	Among the following problems that can be presented in algebraic form are: a. Umar has 10 marbles, the number of Rama's marbles is $\frac{3}{5}$ of Umar's marbles and Wahyu's marbles are 3 times of Rama's marbles. So the total marbles of Umar, Rama and Wahyu are 34 marbles. b. A rectangular book is known for its length (5x-2)cm and width (3x+3)cm if the circumference of the book is expressed in x then the circumference is (16x+2)cm.	 Can give and differentiate examples and non-examples but not yet precise. This can be seen from the answers of students who still answer but with inappropriate wording.

No	Question	Student Answers
4	Determine the set of SPLDV solutions: x + y = 5 and x − y = 1 for x, y ∈ R using the graphical method!	 Students can apply the formula according to the procedure in solving problem solving questions but there are still many mistakes. This can be seen from the students still can not describe correctly.
5	If there are two numbers x and y, where x plus three times y equals 110. Four times x plus y equals 99. Then calculate the value of x plus y!	 There were no students who answered this question. As for those who answered, they only wrote down the questions again. This can be seen from the results of student sheets.
6	The difference in the ages of mother and daughter is 23 years, whereas three years ago the sum of their ages was 31 years. Make a suitable mathematical model!	 Students cannot relate mathematical concepts mathematically to real life. This can be seen from the students who are still unable to relate various mathematical concepts in real life.

By the results of the initial test of underatanding of mathematical concepts, it is known that there is average score of students' understanding of mathematical concepts is 24.58%. According to the percentage criteria adopted by Arikunto & Jabar (2018), it is still low. Question number one is a question for indicator restate the concepts that have been learned is included in the moderate category and the percentage of correct answers is 41.40%. Question number two is a question for indicator classifying objects based on mathematical concepts also fall into the medium category with the percentage of correct answers is 41.40%. Question number three is a question for indicator give examples or counterexamples of the concepts being studied belonging to the medium category with a percentage of correct answer is 35.90%. Question number four is a question for indicator applying concepts algorithmically belongs to the low class, namely with a percentage of correct answer is 23.40%. Question number five is a question for indicator presenting concepts in various representations is included in the low category with a percentage of correct answer is 1.50%. Question number six is a question for indicator linking various mathematical concepts internally or externally is also included in the low class, with a percentage of correct answer 3.90%.

From the symptoms mentioned, the problem is how to foster motivation and understanding of students' mathematical concepts as well as possible for students, so that the learning objectives are achieved. Responding to this problem shows the need for a more approach to students in the learning process to increase motivation and understanding of mathematical concepts. According to Shoimin (2022) said that given the competency demands that must be achieved by students, there is a need for changes in learning strategies. Learning strategies that should be developed are expected to serve and facilitate students to do and do something. The results of research conducted by Aninditya (2014) and Busran (2019), the problem-posing learning model can actually increase student learning motivation. The results of the research conducted by Handayani (2021) and Yuniarsih (2009) concluded that the problem posing learning model can increase motivation to learn and also has an impact on increasing understanding of mathematical concepts. In Shoimin's book (2022), entitled 68 innovative learning models, it states that learning using the

problem posing model can increase student motivation to learn so that active learning will be created, students will not be bored and will be more responsive. Therefore researchers offer alternative solutions to overcome these problems by using the Problem Posing approach.

Ngalimun (2017) states that problem posing is problem-solving through elaboration, namely reformulating the problem into simpler parts so that it can be understood. Lestari & Yudhanegara (2019) the sintax of the problem posing learning model are; Students are grouped five or six people heterogeneously, Students are faced with problem situations, Based on the agreement, students compose questions or formulate problems from existing situations, Based on the understanding of students solve problems, and Students present the results of problem solving.

The Problem Posing approach is a methodological approach to the way students adapt the concepts presented into their cognitive structure, which is in line with the way the teacher presents the material. Learning with the Problem Posing approach in groups makes students faced with problem situations that must be solved. All students are expected to further enrich the basic concepts of mathematics and be active in learning activities. This problem posing approach is expected to be effective in increasing the motivation and ability to understand mathematical concepts of students at MTsN 2 Rantauprapat.

Based on the above thoughts, it is necessary to conduct further research with the title "**Increased Understanding of Mathematical Concepts and Motivation With A Problem Posing Approach on Class VIII MTs Negeri 2 Rantauprapat**".

1.2 Problem Identifications

Based on the background of the study above, the problems identified in this study include the following:

1. Students' understanding of mathematical concepts is low. in terms of the percentage of each indicator understanding the concept that is indicator restate the concepts that have been learned is included in the moderate category and the percentage of correct answers is 41.40%, Classifying

objects based on mathematical concepts also fall into the medium category with the percentage of correct answers is 41.40%, Give examples or counterexamples of the concepts being studied belonging to the medium category with a percentage of correct answer is 35.90%, Applying concepts algorithmically belongs to the low class, namely with a percentage of correct answer is 23.40%, Presenting concepts in various representations is included in the low category with a percentage of correct answer is 1.50%, Linking various mathematical concepts internally or externally is also included in the low class, with a percentage of correct answer 3.90%.

2. Student's learning motivation is enough, it shown from 32 students have current learning motivation Then the average percentage of motivation results obtained, namely 55.98%.
3. Students tend not to have a high desire to participate actively in learning mathematics based on the results of teacher interviews.
4. Students are less able to understand and solve the questions given by the teacher based on the results of teacher interviews.
5. Students are lazy to work on questions because they think math lessons are complicated and boring based on the results of teacher interviews.
6. The model of learning mathematics is still teacher-centered and monotonous.

1.3 Scope of Study

The scope of the problems identified in this study only focuses on the *Problem Posing* approach to increase learning motivation and understanding of students' mathematical concepts.

1.4 Research Questions

Based on the background of the problems above, the formulation of the problems in this study are:

1. Can the Problem Posing approach increase student's understanding of mathematical concepts in class VIII MTs Negeri 2 Rantauprapat?
2. Can the Problem Posing approach increase the motivation to learn mathematics in class VIII MTs Negeri 2 Rantauprapat?

1.5 Scope of Problem

For research to be more effective and directed, the researcher limited the problems, focusing only on increasing motivation to learn mathematics and understanding mathematical concepts for class VIII MTs Negeri 2 Rantauprapat using the Problem Posing approach.

1.6 Study Objectives

The objectives of this study are:

1. Increasing the understanding of mathematical concepts for class VIII students of MTs Negeri 2 Rantauprapat through the Problem Posing approach.
2. Increasing the learning motivation of class VIII students of MTs Negeri 2 Rantauprapat through the Problem Posing approach.

1.7 Research Purposes

This research is expected to provide benefits both from a theoretical and practical perspective, namely:

1. Theoretical Benefits

   This research is expected to provide additional insight and description for other researchers in learning mathematics, especially in increasing learning motivation and understanding students' mathematical concepts.
2. Practical Benefits
   a. For Students

      Providing new and fun learning experiences generates student confidence to play an active role in the learning process,

provides learning motivation and assists students in understanding mathematical concepts.

b. For Teachers

Provides an overview for teachers about the *problem posing* approach and assists in increasing learning motivation and understanding of students' mathematical concepts.

c. For Schools

As input material for school, contribute to improving and improving mathematics learning so that it can achieve the expected curriculum targets.

d. For Researchers

It can be used as a provision and additional knowledge to make researchers become professional teachers in the future.