CHAPTER I
INTRODUCTION

1.1 Background

Education is a necessity for every human being, because education plays an important role in preparing quality human resources. Purwanto (2011: 18) says: "Education is a process of intentional activity on student input to produce results in accordance with the expected goals". In its development education is no longer natural, the process can be developed using more innovative learning models so as to optimize learning outcomes. As a deliberate process, education must be seen from the results achieved, whether it is in accordance with the desired goals and whether the process is carried out effectively to achieve the desired results.

Education can be obtained formally at school as stated by Winkel (2014:212). Education in schools directs student learning to acquire knowledge, understanding, skills, attitudes and values which all support their development. Therefore, learning in schools must be created with a conducive and pleasant atmosphere in order to achieve all the learning objectives that have been set.

Mathematics is one of the subjects that must be studied. especially in formal schools. Given the importance of the role of mathematics in science and technology, mathematics needs to be understood and mastered by all levels of society. This important role of mathematics is recognized by Cockroft (1982:1) who says that: "It would be very difficult or impossible for someone to live in this part of the earth in the 20th century without the slightest use of mathematics". Apart from that, mathematics is a lot in everyday life. In learning at school, mathematics is one of the subjects which is a basic lesson and a tool for scientific thinking that is needed by students to develop their logical abilities. Mathematics education in schools aims to prepare students who can use mathematics functionally to solve problems, both in everyday life and dealing with other

sciences. The mathematical problems faced are structured, systematic and logical so that students can implement them in their lives to solve problems that arise independently.

Mathematics has a very important role in everyday life, it is the role of mathematics that makes mathematics important to learn from an early age. Mathematics teaches us and accustoms us to think critically, reason highly, count, be able to analyze and more importantly we must also be able to apply mathematics in everyday life. This is the same as the opinion of Hasratuddin (2018: 47) who put forward the notion of the importance of mathematics, namely:

> Mathematics is one of the auxiliary sciences that is very important and useful in everyday life as well as in supporting the development of human resources and contains thinking tools to develop logical, systematic, objective, critical, and rational mindsets as well as being very competent in shaping one's personality, so that everyone needs to learn and must be fostered from an early age.

Mathematics as a branch of science that underlies the development of many other sciences, plays an important role in human life. According to Faradhila, Sujadi, & Kuswardi (2013: 68) mathematics is one of the subjects that forms the basis for other knowledge because it contains the ability to count, logic, and think. Because mathematics plays an important role in various disciplines, as a universal science as well as the main foundation of science which makes mathematics a subject that must be studied at various levels of education. Mathematics as the science of abstract objects and problems related to numbers has an important meaning in life. Therefore, in learning mathematics the teacher must choose from a variety of models that are appropriate to the conditions and material presented so that the objectives of a planned lesson can be achieved.

According to Yudha (2019: 87) The role of mathematics education is an important role in society in preparing and forming human resources (HR). Given the importance of mathematics in preparing superior and reliable human resources, learning it requires appropriate learning so that learning objectives can be achieved as expected. Efforts to achieve learning objectives are pursued through the implementation of learning which is one of the main tasks of the teacher where

learning is defined as an activity aimed at teaching students. Every learning process always produces learning outcomes, the importance of learning outcomes in learning mathematics in high school because it is a factor that determines student success.

The implementation of mathematics learning activities in reality still has obstacles that researchers find. Based on the results of observations and the results of a diagnostic test conducted by researchers on April 10, 2023, it is known that student learning outcomes are still said to be low. This is evidenced by the results of the diagnostic tests of 36 students, only 5 students (13,89%) whose learning outcomes were above the KKM score set by the school, namely 70 for the material on the Three-Variable Linear Equation System. The remaining 31 students (86,11%) were declared incomplete. For the diagnostic test given to students, an average score of 45,41 was obtained in the material on the System of Three Variable Linear Equations. So from the data obtained, it can be concluded that, students' mastery of the Three Variable Linear Equation System material is still very low. The questions given were in the form of essay questions as many as 3 questions to 36 students, and no one had been able to answer the diagnostic test questions correctly and correctly overall. From the results of the student diagnostic tests above, it can be seen that the gap in student learning outcomes is that the distance between the scores of the student who gets the highest score and the student who gets the lowest score is quite significant. This shows that students have a pessimistic attitude in learning mathematics. Even though this pessimistic attitude greatly influences the results of learning mathematics.

The lack of students' ability to understand the material presented and the lack of students' ability to do assignments given by the teacher are also factors that cause low student learning outcomes in SMA Negeri 2 Medan.

Based on the results of observations in class X MIPA 2 it is known that in mathematics lessons most of the learning activities carried out in schools are still teacher centered. This phenomenon is because teachers have not been able to create an interesting atmosphere in learning, teachers think that conventional methods are easier to apply and more efficient in carrying out the teaching and learning process.

But in reality students are still passive in learning. The learning process results in student learning outcomes.

As for what causes low learning outcomes, namely the lack of variety of models used by teachers. The teacher still uses the conventional model where in teaching the teacher applies more of the lecture method which is more dominated by the teacher. As a result students become passive and only accept what is given by the teacher. This will have an impact on student learning outcomes in the teaching and learning process. In addition, this will also have an impact on students' lack of confidence, whether asking questions, issuing ideas or opinions or solving problems which ultimately leads to low learning outcomes.

Based on the results of observations when students were asked by the teacher to hold discussions, there were still some students who did not participate in discussions with their groups. They play alone and do not carry out the discussion well. This can be seen from the lack of cooperation between students with one another. In one group there are only a few students doing assignments while the others are playing and joking with other friends.

Muzzilawati, Aeni and Hanifah (2017:1) mention learning is a teaching and learning process in which it consists of teachers and students. Sulfemi and Supriadi (2017:1897) state that learning outcomes are the abilities students have after receiving their learning experiences. Meanwhile, according to Nurrita (2018:174) learning is a change in behavior carried out by individuals so that there is an addition of knowledge, attitudes, and skills as a series of activities towards the development of learning. According to Syafi'I, Marfiyanto and Rodiyah (2018), learning outcomes have three aspects, namely aspects of knowledge, aspects of attitudes and aspects of skills and all three must maximize their potential for achievement.

Learning achievement achieved by students can be influenced by several factors, both from students (internal factors) and from outside students (external factors). Internal factors include interest, talent, motivation, level of intelligence. While external factors include the teacher's factor in applying the learning method and learning environment.

The low achievement of students' mathematics learning is also influenced by the model and learning method used by the teacher. The results of preliminary observations made by researchers at SMA Negeri 2 Medan show that learning mathematics at that school still uses conventional learning models using lecture, question and answer and assignment methods. The use of conventional models is caused by several things, including teachers who have not used new models, teachers who do not follow the development of science and technology so that they are unable to develop learning models and methods that activate students more.

Cooperative learning is a learning model that prioritizes cooperation, namely collaboration between students in a group to achieve learning goals. In cooperative learning students are divided into small heterogeneous groups and with different levels of ability. There are several variations or models in cooperative learning, one of which is the *Group investigation* model.

The *Group Investigation* (GI) Learning Model is a cooperative learning model where teachers and students work together to build learning. Students must be active in several aspects during the teaching and learning process, while the group functions as a means of interaction in forming a learning concept. The *Group Investigation* (GI) cooperative model can train students to develop the ability to think independently. Where students are actively involved from the first stage to the final stage of learning. In short, the advantages of *Group Investigation* can provide opportunities for students to further sharpen their ideas and the teacher will know the possibility of student ideas being wrong so that the teacher can correct these mistakes.

According to Shoimin (2014: 80) *Group investigation* is a form of cooperative learning model that emphasizes the participation and activity of students to find their own subject matter to be studied through available materials, for example textbooks or students can search the internet. . Students are involved since planning, both in determining topics and ways to learn through investigations. This type requires students to have good skills in communication and group processing skills. The *group investigation* learning model can train students to grow

the ability to think independently. Active student involvement can be seen starting from the first stage to the final stage of the lesson.

The privilege of using GI allows for the creation of interesting learning conditions. Mathematics learning which is considered difficult to understand and boring will become more varied, because students will study in groups which can stimulate student activity in learning mathematics. Besides being easy to apply to learning mathematics, GI will enable students to look for problems and solve problems in learning mathematics together with their friends, so that they are able to produce active and meaningful learning. An active learning process is able to make it easy for students to take part in learning without a burden, which then will not cause boredom. GI in mathematics aims to make it easier for students to understand the concept of learning together with their friends in groups. In the investigative learning process, students are required to be active, always thinking about the problems encountered and looking for solutions so that students are trained in developing attitudes and knowledge about mathematical concepts according to the abilities of each student.

Therefore, through the *Group Investigation* learning model, it is hoped that it can provide solutions and a new, interesting atmosphere that is conducive to learning. The *Group Investigation* learning model brings innovative understanding concepts, and emphasizes student activity. It is expected to improve student learning outcomes. Students work with fellow students in a mutual cooperation atmosphere and have many opportunities to process information and improve communication skills.

Based on the background of the problems that have been described, the researchers took action with the aim of improving student learning outcomes in the aspect of knowledge by applying the *Group Investigation* learning model to learning mathematics for class X students at SMA Negeri 2 Medan.

1.2 Problem Identifications

Based on the background of the problem, several problems can be identified as follows:

1. The results of learning mathematics for class X MIPA 2 SMA Negeri 2 Medan at 38.9% is still low.
2. Selection of an inappropriate learning model so that the subject matter is not conveyed properly.
3. Most students are still passive in the learning process.
4. Lack of good cooperation between students and students.

1.3 Problem Limitation

Based on the problem background and problem identification above, it is necessary to limit the problem so that it is more focused and directed. The problem in this research is limited to learning outcomes, in this study the learning model used is a *Group Investigation* (GI) cooperative model on the subject of inverse functions and function composition in class X MIPA 2 SMA Negeri 2 Medan T.A 2022/2023.

1.4 Problem Formulations

Based on the background and problem identification above, the problem formulation in this study is:

1 How is the Learning Outcome of Class X MIPA 2 Students Improved in Learning Mathematics at SMA Negeri 2 Medan through the *Group Investigation* (GI) Cooperative Model?

2 How is the response of class X students of SMA Negeri 2 Medan in learning mathematics by applying the *Group Investigation* learning model?

3 How is the application of the *Group Investigation* learning model in mathematics learning by researchers in class X MIPA 2 SMA Negeri 2 Medan?

1.5 Research Objectives

Based on the problems that have been formulated, this study aims to:

1. To Improve Mathematics Learning Outcomes of Class X MIPA 2 Students through the GI Type Cooperative Model (*Group Investigation*) at SMA Negeri 2 Medan Academic Year 2022/2023
2. To find out the response of class X MIPA 2 SMA Negeri 2 Medan in learning mathematics by applying the *Group Investigation* learning model

3. To find out the application of the *Group Investigation* learning model in mathematics learning by researchers in class X MIPA 2 SMA Negeri 2 Medan

1.6 Research Benefits

A research will have several benefits for researchers and readers and the results of this research are carried out with the hope of being able to provide several benefits, as follows:

1. Theoretical Benefits

The use of the *Group Investigation* (GI) learning model is able to produce research that can add information, knowledge and insight, especially in the field of education regarding whether or not the use of the GI learning model is appropriate for improving student learning outcomes in mathematics.

2. Practical Benefits

The results of this study can directly benefit students, teachers, schools and researchers.

a. For students

It is hoped that by applying the *group investigation* learning model it is able to foster students' enthusiasm in learning to think critically, actively and in groups to produce satisfying mathematics learning outcomes.

b. For Teachers

It is hoped that this research will become input for teachers in carrying out learning innovations, in order to improve the quality of learning in class X MIPA 2 SMA Negeri 2 Medan.

c. For Schools

It is hoped that this research can be input into the learning process that exists in the school, as a place for the birth of a generation of achievers.

d. For Researchers

It is hoped that this research can be a means of increasing knowledge and experience in selecting appropriate learning models which will later be used in carrying out teaching assignments for students in the future.