

CHAPTER I

INTRODUCTION

1.1. Background

Mathematics is one of branch of science that has a very important role in the development of science and technology. Not only that, the mathematics is often described as the Queen of Knowledge. Like a queen in a chess game that has a very important role in the game, so did the math in science. Almost all branches of science both natural and social science requires the application of mathematics.

Mathematics is one of the subjects taught in every level of students education, start from elementary school, junior high school, senior high school until college level. Mathematics is a subject which provides students with a logical, analytical, systematic, critical, and creative thinking that can be their provision to solve daily life problems. Every day students always face mathematics problem, that's why mathematics is one of the compulsive subjects taught in school.

The purpose of studying mathematics according to the Education Minister Regulation of the Republic Indonesia Number 22 Year 2006 on the Content Standards are: 1) Understand the concepts of mathematics, explains the relationship between concepts and apply concepts or algorithms, are flexible, accurate, efficient, and precise, in solving the problem, 2) Using the pattern and nature of the reasoning, mathematical manipulation in making generalizations, compile evidence, or explain ideas and mathematical statement, 3) Solve problems that include the ability to understand the problem, devised a mathematical model, solve the model and interpret solution obtained, 4) Communicate ideas with symbols, tables, diagrams, or other media to clarify the situation or problem, and 5) Have respect for the usefulness of mathematics in life, which has a curiosity, attention, and interest in studying mathematics, as well as a tenacious attitude and confidence in solving problems.

But unfortunately, until now, it is not easy to make students, especially senior high school, to be actively takes place in teaching and learning activities, because some of teachers still apply the traditional learning models. That's why students still find difficulties in understanding mathematics. They still write, read, and memorize the formula that their teacher write without knowing the process. As a result, students generally learn mathematics without being able to use their knowledge to solve problems in diverse or non-familiar situations (de Lange in Thompson. 2008: 96). That's why when they're faced with some different problem, they're unable to solve it.

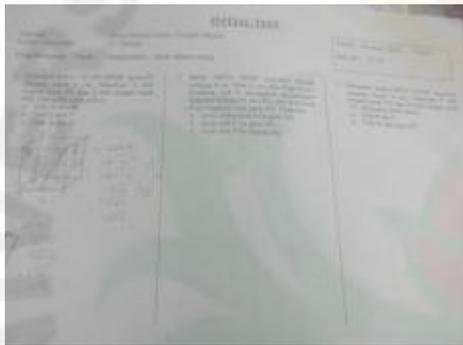
Mastery of mathematics by students becomes a necessity that is not negotiable in the arrangement of reasoning and decision-making at this moment in the era of competitive rivalry. Unfortunately, the learning achievement of students in math is not so satisfy. Based on the report Trends in International Mathematics and Science Study (TIMSS) in 2011, Indonesia was ranked 38th out of 42 countries in math contest at the international level. This is an indicator that shows that the mathematics learning achievement in Indonesia has not achieved satisfactory results.

The subject matter of geometry is one of the subjects of mathematics which is quite difficult for students. The concept of geometry consists of three parts: 1) Geometry is part of the investigation, 2) Geometry viewed as experimental invention, 3) Geometry as part of the produce general conclusions. It therefore requires a model of learning which make students active during learning so that students' understanding of the geometry of the material increases. The problems of the geometry are also experienced by students in SMA Swasta Santo Yoseph Medan.

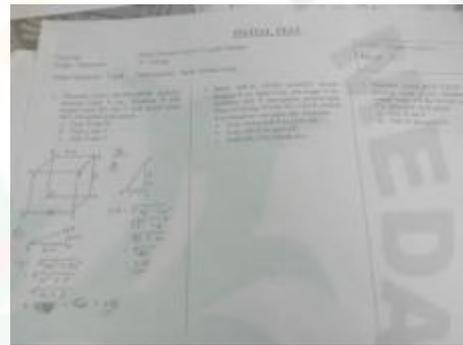
Based on interviews with one of the math teacher at SMA Swasta Santo Yoseph Medan, many students who have difficulty in solving problems of geometry, because the students' understanding of the concept of geometry is still low so that student achievement also low. In addition, the students were also less likely to participate during the learning process. At the time of the learning process, students tend to be silent when asked by the teacher. Often students talk

to a friend or tend to be silent if given problems by the teacher. This indicates that the learning process still not interactive yet.

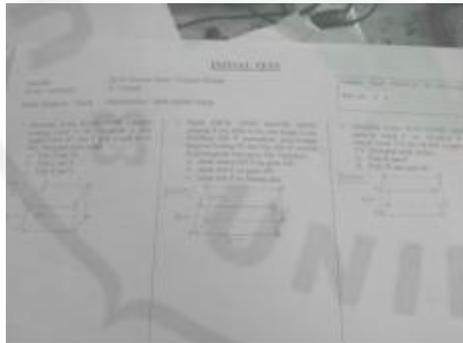
Besides that, researcher also gives some questions for class X-3 as initial test where the participant is 41 students. Then obtained that the average score is 41.4 Where 23 students get low scores (56.1 %), 14 students get medium scores (34.1%), and only 4 students get higher scores (9.8%).



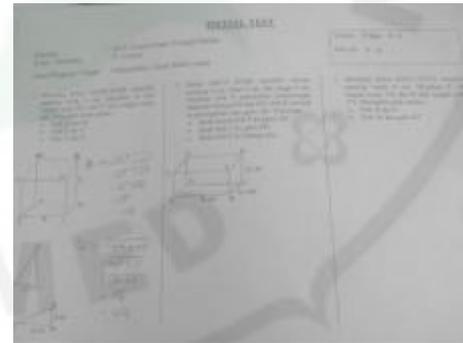
i



ii



iii



iv



v

Figure 1.1 Students' Answer of Initial Test

Figure 1.1 shows answers of some students from initial test. From figure above, shown that there are students that able to answer the question (i,ii,iv), some students able to write down the information and draw the cubes and connecting the points but still cannot answer the question (v), but there also students that only able to draw the cubes (iii). It showed that students still difficult answer questions about geometry. From information above, researcher conclude that this school needs another learning model that can make the students more active and also increase the mathematics achievement of students. Some learning model that can make students active during learning are guided-inquiry learning model and cooperative learning.

According to Seif (Ngalimun. 2014: 33), inquiry means to know how to find out things and to know how to solve problems. To inquire about something means to see out information, to be curious, to ask questions, to investigate and to know the skills that will help lead to a resolution of a problem. Inquiry is a way of learning new skills and knowledge for understanding and creating in the midst of rapid technological change. Kuhlthau (2010: 18) states that inquiry that is guided by an instructional team to enable students to gain a depth of understanding and a personal perspective through a wide range of sources of information is called Guided Inquiry. Guided Inquiry equips students with abilities and competencies to meet the challenges of an uncertain, changing world. Besides that, Schwarz and Gwekwerere (Özdilek and Bulunuz. 2009: 26) stated that inquiry practices are very important in terms of forming scientific knowledge.

Kuhlthau (2010: 18) states that inquiry that is guided by an instructional team to enable students to gain a depth of understanding and a personal perspective through a wide range of sources of information is called Guided Inquiry. Guided Inquiry equips students with abilities and competencies to meet the challenges of an uncertain, changing world. The Guided inquiry leaning model according to Massialas (Matthew and Kenneth. 2013: 136) is a learning model that enables students to move step-by step from the identification of a problem defining the problem formulation hypothesis, collection of data, verification of

results, and generalization to the drawing of conclusion. It places student's ability first in all instructional processes. In other words it is student centered.

With the application of guided inquiry learning model, it is expected to increase the enthusiasm of students in the implementation of learning activities and the students become focus in the leaning process. According to Rokhmatika (2012: 2) guided inquiry is very suitable to be applied in accordance with the characteristics of high school for high school students who tend to be less independent and still need advice, and cues from the teacher. It means that, this model has a positive influence on students' academic success and develops a scientific process skills as well as their scientific attitude.

According to Johnson and Johnson (Aziz. 2010: 2), cooperative leaning is the instructional use of small groups through which students work together to maximize their own and each other's learning. They also found that cooperative leaning helped to improve relationship between high-ability and low-ability students, increasing self-esteem and development of positive attitudes toward mathematics. The same thing also expressed by Abdulhalak (Rusman. 2012: 203) that cooperative learning is carried out through the sharing process among learners, so as to realize the mutual understanding between the learners themselves. So that the cooperative learning is not only a one-way interaction and communication, but will create interaction and communication broader conducted between students and teachers, and students with students. Tom V. Savage (Rusman. 2012: 203) suggests that cooperative learning is an approach that emphasizes cooperation in groups.

Jigsaw is one of the cooperative learning models in which each student is a member of two groups, namely the members of the home group and member of the expert group. This model was developed by Elliot Aronson and his colleagues from the University of Texas (Rusman. 2012:217). The aim of this model is to improve peer cooperation and create team solidarity among students through division of tasks, involves each student in a group to assume learning responsibility.

Based on the general description above, then the researcher is interested to do research with the title “**The Difference of Students’ Mathematics Achievement Taught by Guided - Inquiry Learning Model And Cooperative Learning Type Jigsaw in SMA Swasta Santo Yoseph Medan Academic Year 2014/2015**”.

1.2. Problem Identification

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

1. Student’s participation during mathematics learning process is still low,
2. Student’s still not give enough attentions during learning process,
3. Student’s still difficult in understanding mathematics,
4. Student’s mathematics achievement is still low,
5. Learning process tends to teacher-centered.

1.3. Problem Limitation

This research needs boundaries in order to get the precise target of expectation. The limitations of this reseach are:

1. The model that researcher uses are guided–inquiry learning model and cooperative learning model type jigsaw.
2. The students’ mathematics achievement in this research is bounded in students’ mathematics achievement at geometry in class X SMA Swasta Santo Yoseph Medan academic year 2014/2015.

1.4. Problem Formulation

Based on the background above, the writer formulates the problems of the study as follows:

Is there any difference of students’ mathematics achievement taught by guided-inquiry learning model and cooperative learning type jigsaw in class X SMA Swasta Santo Yoseph Medan Academic Year 2014/2015?

1.5. Objective of Research

The objectives in this research are:

To know whether there is any difference in students' mathematics learning achievement taught by guided-inquiry learning model and cooperative learning type jigsaw in class X SMA Swasta Santo Yoseph Medan Academic Year 2014/2015.

1.6. Benefits of Research

1. For the candidates of teacher, this can be one of the considerations in dealing with problems that occur in the school as the candidate of professional teachers.
2. For the teacher, especially mathematics teacher, this can be considered as one of the models or alternative methods in the process of learning mathematics in school.
3. For the student, this can makes students be more active in class in order to improve the student's mathematics learning achievement.
4. For the research, this can be one of the sources of knowledge in dealing with problems that occur in schools.

1.7. Operational Definition

An operational definition is a procedure or measuring and defining a construct. An operational definition specifies a measurement procedure (a set of operations) for measuring an external, observable behavior, and uses the resulting measurements as a definition and a measurement of the hypothetical construct (Gravetter. 2012:75).

Here are some terms that need to be defined operationally in order to avoid misunderstanding of some of the terms used in this study to be more focused.

So, operational definition in this research are:

1. **Guided Inquiry** is one of level from inquiry that require students to identify the problems where the teacher motivates students to learn by providing

opportunities for them to construct their own meaning and develop deep understanding. The syntaxes of Guided – Inquiry are like the following:

- a. Phase 1: Orientation
- b. Phase 2: Formulate the problem
- c. Phase 3: Formulate a hypothesis
- d. Phase 4: Collecting Data
- e. Phase 5: Testing the hypothesis
- f. Phase 6: Formulate conclusions

2. **Cooperative Learning type Jigsaw**, students were assigned expert topics to read from a regular text or curriculum materials, met in expert groups to master the material, and then returned to their teams to report on their topic. Finally, all students took a quiz on all the material.

The syntaxes type jigsaw are like the following:

- a. Phase 1: Divide students into 5 or 6 person jigsaw groups. The groups should be diverse in terms of gender, ethnicity, race, and ability.
- b. Phase 2: Divide the day's lesson into 5-6 segments. Assign each student to learn one segment.
- c. Phase 3: Give students time to read over their segment at least twice and become familiar with it.
- d. Phase 4: Form temporary "expert groups" by having one student from each jigsaw group join other students assigned to the same segment.
- e. Phase 5: Bring the students back into their jigsaw groups.
- f. Phase 6: Ask each student to present her or his segment to the group.

3. **Learning Achievement**, is the result of an interaction of teaching and learning, which ended with the evaluation of learning achievement. Mathematics achievement that are measured according to the Revised Bloom's Taxonomy by Anderson and Krathwohl at level C1 (Remember), C2 (Understand), and C3 (Apply).