CHAPTER I

INTRODUCTION

1.1. Background of Study

It is undeniable that today education is needed more by society. Education has an important role in everyone's life, without education, someone will be difficult to obtain a better life. Education is a systematical process to acquire the knowledge, experience, skills and a good attitude. Therefore, education does not only provide knowledge, but also teaches the specific skills and how to be good.

Law of the Republic of Indonesia Number 20 of section 3 Year 2003 on National Education System states that the national education has function to develop skills and character development and dignify nation civilization in the context of the nation life, aims to develop students' potential to be a man who has faith and fear of God Almighty, have a noble moral, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens.

The purpose of education above shows that the problem of education can not be done only by one party namely school but also be the other responsibility like as society, state and nation. Therefore, everyone needs to be involved in the educational process. Formal education (schools) involving teachers and students, is manifested in the form of teaching-learning interaction.

The purpose of teaching and learning process is to achieve the students' success in learning. Today, teaching and learning process is expected to be fun, challenging, and motivating for students to participate actively, creatively, and innovatively according to their talents, proclivity, physical development, and psychological. Therefore, highly expected the center of the teaching and learning process is the students, not the teacher. But the teacher is not able to discharge of their responsibilities, but still facilitate students.

Mathematics is one of the subjects taught in elementary school, junior high school, senior high school and college. Mathematics is the science which is very important to be mastered, because it is indispensable in daily life and a subject which provides students with logical, analytical, systematic, critical, and creative thinking. So the mathematics is one of the compulsive subjects taught in school that certainly has an important role in achieving educational goals.

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. To understand the concept of mathematics, explain the relationship between concepts and apply concepts or logarithmic flexibly, accurately, efficiently and appropriately in problem solving;
2. To use the reasoning of pattern and characteristics, do manipulation of Mathematics in making generalizations, arrange the evidence, or explain the ideas and statements of mathematics;
3. To solve problems which mean the ability to understand the problem, design mathematical model, complete the model and interpret the obtained solution;
4. To communicate ideas with symbols, tables, diagrams, or other media to clarify the situation or problem;
5. To have respect for the usefulness of mathematics in daily life, namely having curiosity, attention and interest in studying mathematics, also a tenacious attitude and confidence in problem solving.

In order to achieve the goals of learning mathematics, it is needed the role of various components such as: students, teachers, learning indicators, subject content, learning model, methods, media, and evaluation. Teacher as one component of teaching and learning activity has a very important role in achieving the learning objectives and determine the success of the educational process. Teacher must be able to motivate their students to engage in the teaching and learning process.

Teachers are expected to develop their professionalism in teaching students so that their function in class is not only as speaker. They should be able to make every student be active in the teaching and learning activity. Students are not as audiences as well, but also take active role in the teaching and learning process.

Unfortunately, it is not easy to motivate students, especially senior high school students to be active in teaching and learning activities because teachers often apply the traditional learning model. So most of the teachers directly provide mathematical formulas to the students and the students only see and memorize the formulas. So do not be surprised if they think math is very bored and dreaded. They think if they cannot memorize formulas they will get low score at math test and worse when they just memorize formulas without knowing the actual math concepts (how to get the formula). As the result, when teachers give a different question from the example, the students are confused and fell difficult to solve it. So the math scores of students are still low.

Martinus (2014: 75) says that to study mathematics is required a good understanding of the concept in which in order to form the new concept understanding, necessary understanding of the concept before. However, as revealed by Ruseffendi and Wahyudi (in Martinus. 2014: 76) that many children after studying mathematics, simple part was much he did not understand, because many of the concepts are misunderstood, which means that the students' understanding of the concept of the low. Team of science education development-UPI (2007: 198) says that the learning and teaching process which is implemented by teacher at the class is classically and only rely on textbooks with a teaching method that emphasizes the process of memorizing rather than understanding the concept. So that when students are given problems or test, will have difficulty in solving and can get low score.

The low of students' achievement for mathematics in Indonesia is also proved from the results of international research. UNESCO shows that Indonesia

was ranked 36 of 49 countries in the Trends in International Mathematics and Science Study (TIMSS) test (IBE, 2011: 25). The rank of Indonesia in math test, held by PISA is 64 of 65 countries with a score of 375 which is a score below the OECD average (http://www.theguardian.com/news/datablog/2013/dec/03/pisa-results-country-best-reading-maths-science).

This problem is also occurred in SMAN 3 Pematangsiantar. The math teacher of SMA N 3 Pematangsiantar complained that the score average of daily math test is still around 60 whereas KKM (minimum passing criteria) is 75. It indicates that it does not achieve the value of KKM for math. Based on data obtained from DKN in grade X SMA N 3 Pematangsiantar, the average of students' achievement for mathematics also has not been satisfactory as shown in the following Table 1.1.

Table 1.1 The Average Value of Odd Semester Examination for Mathematics in Grade X SMA N 3 Pematangsiantar Academic Year 2014/2015

No	Type of Test	The Average Value	KKM Value
1	Odd Semester Exam	61.7	75

From the table it can be seen that the value average of odd semester exam of class X is below of the minimum passing criteria with the percentage of students who have score below the minimum passing criteria is 83%. The odd semester exam consists of level knowledge (C1), comprehension (C2) and application (C3), which means that the achievement of students up to level C3 is still low.

Trigonometry is one of the mathematical materials that generally considered difficult by students. This is proved from a journal that is studied by the Tuna and Kacar (2013) in which the pre-test (given before treatment) of students' Kastamonu in grade X toward Trigonometry was 4.640 for the experimental class and 4708 for control class whereas after had been given a

certain treatment by the researcher, students' test scores average could reach 20.76 for experimental class and 16.00 for the control class. Hidayah (2013) also found that students' achievement for trigonometry is still low. He revealed that from observations, students of high school grade X considers mathematical material especially for trigonometric ratios is difficult and students are still confused in the use of formulas of trigonometric ratios. This is because most of students tend to memorize trigonometric ratio values in a special angle. It is also the same as that revealed by a math teacher in SMA N 3 P.Siantar that when asked about the trigonometric ratios or exam, students often made the wrong formula which is supposed for sinus, cosines, etc. Students also just like memorizing the formulas and completion of the examples given by the teacher, which is known from the students often ask the teacher how to memorize the formula.

The above problem must be overcome in order not be sustainable. One of the ways is refinement to the arranging and application of learning models used by the teacher. The learning model which is appropriate, effective and making the students closed to the teacher will make students enjoy to study and be more active, so students can improve their understanding of mathematics.

From some existing learning models, one way to deal with the above problem is by guided-discovery learning model. Lefancois (in Depdiknas. 2013) said that the discovery learning can be defined as the learning that takes place when the student is not presented with the subject matter in the final form, but rather is required to organize it himself.

According to Cetin (2004: 15) discovery learning makes students to be brave to participate (active) during the instructional process, and they are able to find out for him / invented the concept of the material being studied. For example, the teacher presents a problem and students solve the problem until they find out the interrelationship. But because students in high school are not accustomed to find out own the solving of the problems presented, they still need the guidance of

the teacher and the model is known as the guided-discovery learning models. So that, the closeness between teachers and students keeps well.

Guided-discovery learning model has been studied by Kholik and Sugiyono (2013: 9), their journal entitled "Implementation of Guided Discovery Learning Methods to Improve Motivation and Mathematical Learning Achievement" indicated that the average of learning achievement in mathematics increased to 85.18 from 78.57. Akanmu and Fajemidagba (2013: 85) in the journal entitled "Guided Discovery learning Strategy and Senior School students Performance in Mathematics in Ejigbo, Nigeria" also reveal the same thing, namely that students taught with guided discovery learning had a significantly higher scores than students taught by non-guided discovery learning.

Cooperative learning model also can make students to be active. In addition, "cooperative learning is the instructional use of small groups so that students work together to maximize their own and others' learning" (Johnson, et al in Bruce. 2002: 3).

Bruce added (2002: 3), "cooperative learning enables skills in working as teams, skills that are in dire demand in the workplace". Jigsaw is type of cooperative learning model in which each student becomes a member of two groups, namely the member of the home group and the member of the expert group so that students do not get bored because the discussions during the lesson they not only meet in one group. Jigsaw cooperative learning model makes every student to be responsible and foster a desire / effort to understand the parts of the lessons to be learned and deliver the material to the other group members. So that students can develop the positive relationships among his friends who have different capabilities, to help friends who have difficulty in understanding mathematical concepts and improve self-esteem of student.

From the journal of mathematics education by Meilawati (2013: 41) with the title "The Way to Improve Mathematics Result Through Jigsaw Cooperative Learning" states that the use of cooperative learning model type of Jigsaw has a

positive impact in the learning process that is characterized by increase the average of student's achievement in mathematics into 83.59.

Based on the above description, the researcher is interested in conducting research with the title "The Difference of Students' Achievement in Mathematics by Using Guided-Discovery Learning Model and Cooperative Learning Model JIGSAW Type at SMAN 3 Pematangsiantar".

1.2 Problem Identification

Based on the background can be identified some of problems as follows:

1. Teachers tend using a learning model which centered to teacher, so that students are less actively involved during the learning process.

2. Lack of students' understanding to mathematical concepts because students just memorize the mathematical formulas so they have difficulty in doing math problems.

3. There still needs the repair to students' achievement in mathematics at SMAN 3 P. Siantar because there are students get low score of math test.

4. Guided-discovery learning model and cooperative learning model type of JIGSAW have difference steps to presenting the mathematical material.

1.3 Problem Limitation

In order this study to be more specific and focused, this research is limited in scope:

1. Students' achievement in mathematics class X at SMA N 3 P. Siantar, Academic Year 2014/2015

2. The learning models in this study are categorized by guided-discovery learning model and cooperative learning model type of Jigsaw.

1.4 Problem Formulation

Based on problem limitation stated above, the formulation of the problem in this study is:

Is there any difference of students' achievement in mathematics which using guided-discovery learning model with using cooperative learning model Jigsaw type in class X SMA N 3 P. Siantar?

1.5 The Objective of Research

The purpose of this research is:

To know any difference of students' achievement in mathematics which using the model of guided discovery learning with cooperative learning model JIGSAW type in class X SMA N 3 P. Siantar.

1.6 The Benefit of Research

1. For teachers, especially teachers of mathematics, this study can be used as consideration in choosing learning model used in teaching and learning activities at school.

2. For students, this research can make students more motivated to increase their achievement in mathematics.

3. For researchers, this study can be used as a reference and to increase knowledge of researcher about the problems that occurred in schools.

1.7 Operational Definition of Variable

Operational Definition is the definition of all variables that will be used in a study based on properties of the term definition which is observed, so that the reader / testers can easily interpret the meaning of the study.

In this study, the operational definition of the variables is:

1. Guided-Discovery Learning Model

   The guided-discovery learning model is learning model that directs teacher to assist students in making the discovery. Form of guidance provided by the teacher is the form of instructions or questions, so that students are expected to conclude (generalize) in accordance with the design of the teacher. Therefore, students need to really actively learn to find own the material learned and have to prepare himself before class is started.

2. Cooperative Learning Model JIGSAW Type

   Cooperative learning model Jigsaw type is learning emphasized to students in learning activities of group which consists of 4-6 students with heterogeneous capability, and each student enters into two groups namely the origin and expert groups. Each member of the expert group has to responsible for the completeness of section discussed and delivering these materials to members of the original group. Finally, every student realizes that he needs to have the initial knowledge about material will be discussed.

3. Student's Achievement in Mathematics

   The students' achievement in mathematics is the results achieved by students especially for domain of cognitive in level knowledge (C1), comprehension (C2), Application (C3), using the test as a measure of student success. Researcher determines the domain of cognitive in level C1, C2 and C3 with reason that 83% of students do not able to reach value of semester examination in level C1, C2 and C3 above the minimum passing criteria.