CHAPTER I
INTRODUCTION

1.1   Background

Progress of a nation can be seen from the quality of its human resources. Intelligent nation is a people of nation that is able to use all its resources correctly and the maximum is in the form of natural wealth, cultural diversity, ethnicity, and language in order to support the country's progress. One of the things that need to be considered to improve the intelligence and the quality of the nation is to improve the education of all its human resources. One type of education that needs to be improved in this time is a formal education.

Formal education occurs in a structured environment whose explicit purpose is teaching students. Formal education usually takes place in a school environment, with classrooms of multiple students learning together and taught by professional teacher. As formal education institutions, schools are born and grow effectively and efficiently to the community, It also as a tool to provide services to young people in educating citizens. Of course, the service provided must be the best and responsible. In this case, the teacher has an important role in the services. Teachers must creative in teaching so that students are interested and active in learning. One effort that can be done by the teacher is to implement learning strategies.

Mathematics is a compulsory subject set by the government to be learned by students ranging from elementary to high school. This is because mathematics has an important role in the progress of a country. In Learning mathematics students must have comprehension, skills, and knowledge which is this aspect are known and can be done by teachers and students on learning mathematics in a school. NCTM (2015) states that the expected goals in learning mathematics are to set of five process standard that must be owned by student are   problem solving, Reasoning and Proof , Communication , Connection , Representation.

Representation is a form of interpretation of students' thinking of a problem which is used as an aid to find solutions to these problems. Students can

be a form of interpretation of words or verbal, text, images, tables, graphs, concrete objects, mathematical symbols, and others.

Representations should be treated as essential elements in supporting students' understanding of mathematical concepts and relationships; in communicating mathematical approaches, arguments, and understandings to one's self and to others; in recognizing connections among related mathematical concepts; and in applying mathematics to realistic problem situations through modeling. New forms of representation associated with electronic technology create a need for even greater instructional attention to representation. So, representations underpins conceptual understanding, communications, connections, and problem solving. All of these processes are assisted by an effective representation. Students should engage with each of these in all of their mathematics courses, so that be effective presentations.

- create and use representations to organize, record, and communicate mathematical ideas;
- select, apply, and translate among mathematical representations to solve problems;
- use representations to model and interpret physical, social, and mathematical phenomena.

At times, teachers should present a representation explicitly, while at other times, they should guide students to "discover" how best to represent a mathematical model.

But on last situation Mathematical representation ability of students is in school less attention since many student don't comprehend about their mathematical representation ability. Though mathematical representation ability is very important in learning mathematics since facilitating the students to represent problem in form of mathematical visual object which is more interesting.

From the initial test which has been conducted by researchers to students, it is known that the ability of students' mathematical representation is still low. it can be seen from the answers that they make. Some of them are not able to create a table of story problems correctly, not able to solve problems of the images

presented, and less able to write the conclusion of the diagram presented. The following are some of the documentation of student test results.

Question 1.

The teacher return the semester exam scores of 25 students X IPA A. afterwards where the data was obtained, Rani and Edi scored 90, Adi and Sinta and **a** friend got the lowest score are 55. Ani, Devi, Gita scored 60. While Suci, Lea, and **seven** others received a score of 70, **on the other hand** there were **seven** students scored 10 points lower than Rani and Edi. For the highest score, achieved by mina value 95. Based on the problems above, make X IPA A student scores into the table.

Answer 1.

| Nama	Nilai
1. Rani dan Edi	90
2. Adi dan Sinta	55
3. Ani. devi, dan Gita	60
4. Suci dan Lea	70
5. 7 org siswa	10
6. Mina	95

Figure 1.1 Observation Result of Student's Answer Number 1

From the answers above, we can see that the students have not been able to represent story problems into the form of a table correctly. students are not able to enter the data correctly into the table, the frequency of data which he wrote different from the frequency of the data in question.

Question 2.

The following figure illustrates parents occupation of 48 students. Determine how many parents who work as:
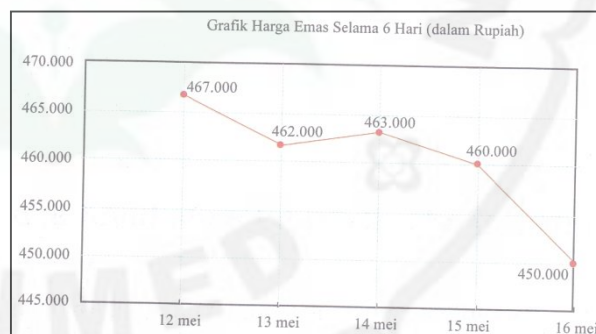
a. PNS   b. Farmer   c. Entrepreneur
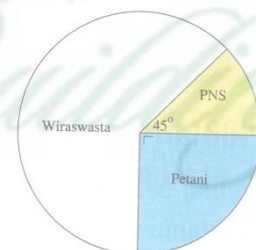
Answer 2

Figure 1.2 Observation Result of Student's Answer Number 2

From the answers above, we can see that the students have not been able to represent the image into the form of mathematical expressions. She can not understand the questions well so that way represents the answer is irrational

Question 3.

Consider the price of gold for 5 days in the month of May 2013 below. Give an appreciation of the data and make the conclusion from the diagram.

Answer 3

Figure 1.3 Observation Result of Student's Answer Number 3

From the answers above, we can see that the students have not been able to represent images into written text correctly because students are less able to appreciate the graph based facts contained data. He just appreciate graph based personal opinion.

Based on these problems, researchers can surmise that the students will have difficulty in the future to manage the problem so that it will also affect Student's mastery and understanding in mathematics. Student's Mathematical Representation ability still low because the learning model used by mathematics teachers poorly in developing student's ability. They still using conventional learning. It requires students to strive themselves in learning. it is not suitable to be applied to the student in this modern era.

Students should be encouraged to play an active role in learning, teachers must also be able to involve in technological sophistication in learning so that students feel more passion and learning are more interesting. So, Student's Mathematical Representation ability will be improve well when teachers use the right teaching methods. One of the right methods to improve that ability is implementing cooperative learning method. This method of stimulating among students to help each other in solving a problem, so that every student has the opportunity to understand the learning well. As stated of Trianto (2009 : 59) that:

> "Para ahli telah menunjukkan bahwa pembelajaran kooperatif dapat meningkatkan kinerja siswa dalam tugas-tugas akademik unggul dalam membantu siswa menumbuhkan kemampuan berpikir kritis. Pembelajaran kooperatif dapat meningkatkan keuntungan baik bagi siswa kelompok bawah maupun kelompok atas yang bekerja bersama menyelesaikan tugas-tugas akademik".

From the statement above, can be concluded that cooperative learning can improve Student's Mathematical Representation ability. This is also reinforced by the relevant research conducted by Tri Fauji in 2014, the results showed that the implementation of Cooperative learning TPS type can improve students' mathematical representation ability. As well as research conducted by Tyas Wardani in 2015 states that Cooperative Learning STAD type can improve students' mathematical representation ability. It's mean that, cooperative learning TPS and STAD are two types of cooperative learning that can improve students' mathematical representation ability.

Think- Pair- Share (TPS) is a cooperative learning that a combination of self-learning and learning in groups which students work together to solve a

problem or answer a question about an assigned reading. This technique requires students to (1) think individually about a topic or answer to a question (*it is possible that students can solve these problems own*); and (2) share ideas with classmates. Discussing an answer with a partner serves to maximize participation, focus attention and engage students in comprehending the reading material.

While, Student Teams Achievement Division (STAD) is a type of cooperative learning with learning team- work. The main idea behind the model STAD is to motivate the students to encourage and help each other to master the skills presented by the teacher.

Based on background above, research interested in conducting research entitled: **"The Difference Of Student's Mathematical Representation Ability Taught By Using Cooperative Learning TPS With STAD Types For Grade X in SMA Negeri 7 Medan"**

1.2 Problem Identification

Based on the background presented above, can be identified issue:

1. Student's Mathematical Representation Ability is still low
2. Lack of Student's activeness in Learning Mathematics

1.3 Problem Limitation

The problems limitation in this research are as follow:

1. The author focus with The Difference Of Student's Mathematical Representation Ability Taught By Using Cooperative Learning TPS With Cooperative Learning STAD Types For Grade X in SMA Negeri 7 Medan.
2. Learning in this Research topic is Statistics

1.4 Problem Formulation

The problems formulation in this research is : "Whether Student's Mathematical Representation Ability taught by using Cooperative Learning TPS type is higher than Cooperative Learning STAD Type for Grade X in SMA Negeri 7 Medan ?

1.5   Research Purpose

Research purpose in this research are : to know whether student's Mathematical Representation Ability taught by using Cooperative Learning TPS type is higher than Cooperative Learning STAD Type for Grade X in SMA Negeri 7 Medan.

1.6   Benefit of Research

The benefit of this research are:

1. For Teachers and prospective teachers, can be used as a references to choose a better learning model not only in Statistics but also in another topics.
2. For Students, to use the cooperative learning Think-Pair-Share type can improve the student's mathematical representation ability.
3. For School, is expected to be source of information or contribute ideas for improvement of mathematics teaching and learning.
4. For Researches, can be used to increase the knowledge about both of cooperative learning model so it will be easier to apply them to other learning topics.

1.7   Operational definitions

To avoid difference of meaning clarity about important terms contained in this research, The operational definition be stated as follow:

1. Mathematical representation ability is the ability of students in the depiction, translation, disclosure, re-appointment, figuratively, or modeling, the idea of a concept in mathematics as an effort to gain clarity of meaning, show understanding or looking for a solution of his problems. which can be interpreted in the form of words or verbal, text, images, tables, graphs, concrete objects, mathematical symbols etc.
2. Cooperative Learning Think- Pair-Share (TPS) type: The think, pair, share strategy is a cooperative learning technique that encourages individual participation and is applicable across all grade levels and class sizes. Students think through questions using three distinct steps:

Think: Students think independently about the question that has been posed, forming ideas of their own.

Pair: Students are grouped in pairs to discuss their thoughts. This step allows students to articulate their ideas and to consider those of others.

Share: Student pairs share their ideas with a larger group, such as the whole class. Often, students are more comfortable presenting ideas to a group with the support of a partner. In addition, students' ideas have become more refined through this three-step process.

3. Cooperative Learning Student Teams Achievement Division (STAD) type is one of the simple and effective method in cooperative learning.

In the process of learning, STAD cooperative learning consist of four steps as follow:

Step I: Teach (Class Presentation)

The class presentation is a teacher-directed presentation of the material---concepts, skills, and processes---that the students are to learn.

Step II: Team Study

a. In STAD teams are composed of four students who represent a balance in terms of academic ability, gender, and ethnicity.

b. Team members work together with prepared worksheets and make sure that each member of the team can answer all questions on the worksheet

c. Students have the responsibility to make sure that their teammates have learned the material. No one is finished studying until all *teammates* have mastered the subject.

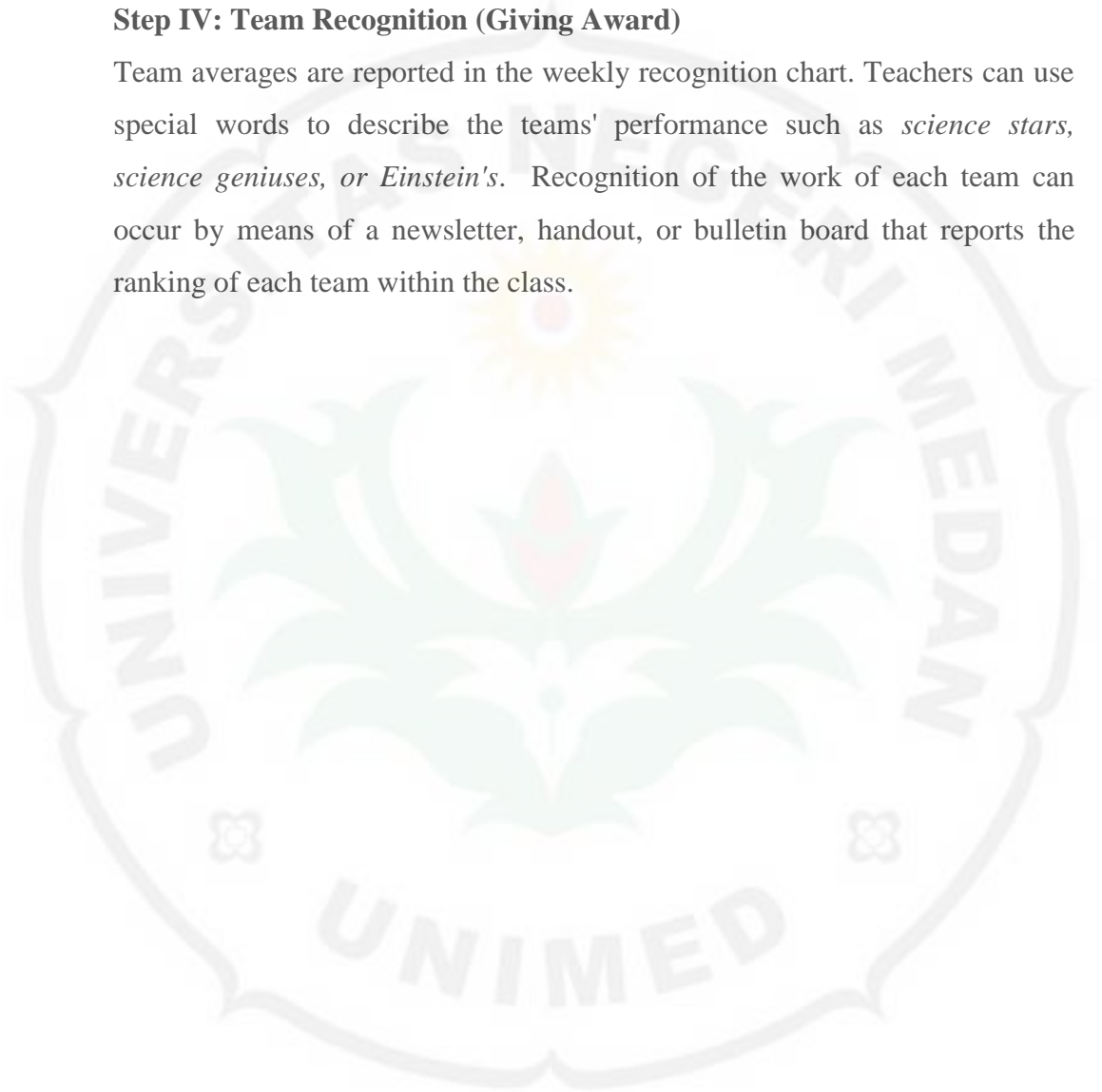d. Ask all teammates for help before asking the teacher.

Step III: Test

After the team study is completed, the teacher administers a test to measure the knowledge that students have gained. Students take the individual tests and are not permitted to help each other.

Step IV: Team Recognition (Giving Award)

Team averages are reported in the weekly recognition chart. Teachers can use special words to describe the teams' performance such as *science stars, science geniuses, or Einstein's*. Recognition of the work of each team can occur by means of a newsletter, handout, or bulletin board that reports the ranking of each team within the class.