

CHAPTER I INTRODUCTION

1.1 Background

In the 21st century, national education system is trying to set up human resources quality to compete in the global era. The tool for building human resources with high quality is education. The Government has organized repairs to improve the quality of education, but the facts have not shown satisfactory achievement especially in mathematics achievement.

To increase student achievement, government has made efforts to improve learning quality in schools. The Application of Educational Unit Level Curriculum (KTSP) demand paradigm change in education and learning in schools. According to Komaruddin (in Trianto, 2009: 8), some of those changes are learning orientation which teacher centered at first to student centered; methodology which was dominated by expository at first become participatory and approach which textual at first to contextual.

One of the interesting innovations that accompany the change of paradigm was found and implemented of innovative-progressive learning models that are able to develop and explore the knowledge of students concretely and independently. The selection of learning model was adapted to characteristics of material, student and learning methodologies in order to increase the activity and creativity of students.

One of some topics that quite difficult to understand of student at the junior high school is geometry. Based on the identification of problems at the time of training activities in Mathematics P4TK, many teachers find difficulties to teach flat area and polyhedral volume (Yeni, 2011: 64).

That statement was also supported by the results of initial observations and interviews conducted with Mr. Saheri as mathematic teacher at SMP Negeri 1 Tebing Tinggi. He stated that the level of student understanding in polyhedral is still low and the results of tests carried out to the students are still under the standard. The student achievement average of middle test before remedial of in

two classes are 40,68 and 39,24. The minimum successful criteria (KKM) of mathematic are 75.

Many mistakes are made when students solve geometry problems, especially polyhedral. This is supported by a research that conducted by Anis Sunarsi as a student in University of Sebelas Maret on 2009. Her research analyzes some of the mistakes made by students for solving problem of surface area and volume of prism and pyramid. Those mistakes are: (1) Mistake in receiving information and mistake associated with the concept of prism and pyramid; (2) Mistake in the received information, that is an error in writing down what is known and what is asked in problem; (3) Mistake associated with the concept of the prism and the pyramid, that is a mistake in using and applying the formula; (4) Mistake in finding the surface area of pyramid; (5) Mistake in finding the volume of the pyramid; (5) Mistake in determining the base and top of prisms and mistake in determining the polyhedral shape that is requested.

Those mistakes shown that student have low ability in solving problem. This can be concluded from problem solving indicator that formulated by Polya, that is: (1) understanding the problem; (2) Planning the solution; (3) solve the problem according to planning and; (4) to re-evaluate the procedures and results of the solution (Tarhadi and friends, 2006: 122)

The low ability of student in solving problem due to the learning of geometry at this moment still tends to be teacher centered so that can lead to underdevelopment of the thinking skills of students. For example, the prism sub topic of polyhedral that is often taught using conventional teaching, the teacher explained the formula of volume and surface area of prism and then the student should be able to memorize the formula for solving the given problem.

The teacher said that if they carried out student centered learning, curriculum targets can not work as expected. One of the reasons is takes relatively long time, but the curriculum must be completed. But teachers are required to use variation methods, not only lectures but also other methods that more emphasis on active learning, creative, effective and fun.

Polyhedral is one of the sub topics in mathematics that are closely related to daily life. This can facilitate student active to construct their own concept and also fun. It is not easy thing to realize students discover and construct their own concept of polyhedral through experience, and then it can be concluded in a common formula. But if not done at all, there will be no change in learning practices that aim to enhance students' cognitive development and creativity. Thus required an effort to locate, establish and develop appropriate learning model and accordance with the conditions of student learning, that is active, creative, effective and fun.

One model that can be applied is a cooperative learning model. Cooperative learning is a model that emphasizes learning activities of student in small groups so that student can work together to achieve learning objectives. Students in cooperative learning groups learn to discuss, help each other, and invite each other to overcome learning problems. Cooperative learning makes student condition to be active and give each other support in the working group to resolve problems in learning.

Johnson and Johnson (in Trianto, 2009: 57) stated that the purpose of cooperative learning is to maximize student learning to improve academic achievement and understanding of both individuals and groups. Zanroni (in Trianto, 2009: 57) also stated the benefits of the implementation of cooperative learning is to reduce inequalities in education, especially input form at the level of individual.

The experts have also shown that cooperative learning can improve student performance in academic tasks, excels in helping students understand difficult concepts and develop critical thinking skills (Trianto, 2009: 59).

To support statement above, Richard I. Arends (2009) also said that cooperative learning model was developed to achieve at least three important instructional goals: academic achievement, tolerance and acceptance of diversity, and social skills development.

Cooperative learning has several approaches, such as Student Teams Achievements Division (STAD), Jigsaw, Team Investigation, Teams Games

Tournament (TGT), Think Pair Share (TPS) and Number Head Together (NHT). Those approaches are distinguished from cognitive goals, social goals, team structure, topic selection, the main task, assessment and recognition.

Cooperative learning Jigsaw and Think Pair Share (TPS) approach are two alternative solutions that can be implemented in mathematic learning. Because by using both approach students will more active in learning process and then it will be expected to increase mathematic student achievement. By using Jigsaw approach student will more active because each student has responsibility in solving problem and explain their assigned topic to another student. And by using Think Pair Share approach student will more active because student has two opportunities, to work alone first and then cooperate with another student. So, before they cooperate with other student, they have preparation to make discussion. In this approach, student discuss in pairing so that they can communicate directly with their pair and it will make effective discussion in class.

In Jigsaw approach, Students start out in heterogeneous home or base teams comprised of four or five members. Members number off and then move to expert groups. Each expert group learns a different part or aspect of the assigned topic. They read and discuss learning materials provided by the teacher and help each other learn about their assigned topic. They also decide how best to present the material to others when their home teams reconvene. Each member of the team teaches their part to other home team members. (Richard I. Arends and Ann Kilcher, 2010: 316)

This gives the possibility to student engaging actively in discussion and communication with each other both in the home team and the expert group. Skills to work and learn cooperatively studied directly in the activities of the two types of grouping. Students are also given motivation to constantly evaluate their learning process.

In Think Pair Share (TPS) approach, the teacher poses a question, individual students think about (and record) their answer. Individuals then pair with another student to share their answer. The teacher calls on individuals or

pairs to share with the large group (Richard I. Arends and Ann Kilcher, 2010: 316). So this model provided all students time to think and opportunity to respond.

Some of the consequences of this model is students can communicate directly with other individuals, keep each other informed and exchange ideas and able to train to defend his/her opinion if that opinion is worthy to be preserved.

The successful of the use cooperative learning jigsaw and think pair share approach conducted visits of student achievement in mathematics to understand and utilize this understanding for solving mathematic problems and other sciences.

Problem solving here is an attempt to find a way out performed in achieving the goal. It is based on Polya statement in Firdaus (2009) which states that problem solving is an attempt to find out solution of a difficulty to achieve an objective that is not immediately be reached.

Problem solving skill is very important for students because of various reasons. The reason is confirmed by Branca in Firdaus (2009):

1. Problem solving skills is a common goal of teaching mathematics.
2. Problem-solving that include methods, procedures and strategies is a core and major in mathematics curriculum
3. Problem solving is a basic ability in learning mathematics.

Learning approach is developed appropriate with learning objective that will be achieved. By seeing student achievement after taught student using cooperative learning jigsaw approach and think pair share approach, then can be concluded are both of those approaches effective to achieve learning objective of mathematic and which approach that will more effective after implemented in class.

Based on explanation above, the researcher were motivated to conduct a research entitled "The Comparison of Problem Solving Skills of Student using Cooperative Learning Jigsaw Approach and Think Pair Share (TPS) Approach on Prism Subtopic in VIII Grade at SMP Negeri 1 Tebing Tinggi".

1.2 Identification of Problem

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

- ❖ Many mistakes which made by students at SMP Negeri 1 Tebing Tinggi for solving problem of polyhedral
- ❖ Mathematic understanding of student at SMP Negeri 1 Tebing Tinggi in polyhedral is low
- ❖ Problem solving skills of student at SMP Negeri 1 Tebing Tinggi on polyhedral topic is still low
- ❖ Learning polyhedral at SMP Negeri 1 Tebing Tinggi is still oriented to teacher

1.3 The Scope of Problem

In order to avoid misperceptions and expansion issues, this research is restricted in prism subtopic about surface area and volume in VIII grade at SMP Negeri 1 Tebing Tinggi.

1.4 Research Question

Based on the background and identification of problem above, the research questions are:

1. Can cooperative learning Jigsaw approach increase problem solving skills of student on prism subtopic in VIII grade at SMP Negeri 1 Tebing tinggi?
2. Can cooperative learning Think Pair Share (TPS) approach increase problem solving skills of student on prism subtopic in VIII grade at SMP Negeri 1 Tebing tinggi?
3. Is there any difference of problem solving skills of student that taught by cooperative learning Jigsaw approach and Think Pair Share (TPS) approach on prism subtopic in VIII grade at SMP Negeri 1 Tebing tinggi?
4. What kinds of mistake that student made for solving problem on prism subtopic that taught by cooperative learning Jigsaw in VIII grade at SMP Negeri 1 Tebing tinggi?

5. What kinds of mistake that student made for solving problem on prism subtopic that taught by cooperative learning Think Pair Share in VIII grade at SMP Negeri 1 Tebing tinggi?

1.5 Research Objectives

The Objectives of this research are:

1. To find out whether cooperative learning Jigsaw approach can increase problem solving skills of student on prisms subtopic in VIII grade at SMP Negeri 1 Tebing tinggi
2. To find out whether cooperative learning Think Pair Share (TPS) approach can increase problem solving skills of student on prisms subtopic in VIII grade at SMP Negeri 1 Tebing tinggi
3. To find out is there any difference of problem solving skills of student taught by cooperative learning Jigsaw approach and Think Pair Share (TPS) approach on prisms subtopic in VIII grade at SMP Negeri 1 Tebing tinggi
4. To find out the kinds of mistake that student made for solving problem on prism subtopic that taught by cooperative learning Jigsaw in VIII grade at SMP Negeri 1 Tebing tinggi
5. To find out the kinds of mistake that student made for solving problem on prism subtopic that taught by cooperative learning Think Pair Share in VIII grade at SMP Negeri 1 Tebing tinggi

1.6 Research Benefits

The benefits which expected of this research are:

- a. The benefits for author
 - Increasing knowledge of the authors in conducting research in educational field in the future
 - Gaining experience in applying learning model and provide a quality learning

- b. The benefits for education
- As consideration for the teachers in formal educational institutions in an effort to improve student achievement in mathematics
 - As a comparison for the next researchers in examining similar issues

1.7 Operational Definition

The operational definitions in this research are:

- a. Cooperative learning Jigsaw approach is learning model where student involve in two teams or groups, those are home teams and expert groups. First students are assigned to four or five students heterogeneous as the home team. Each member in this team has different part of learning material. The student that has same part is grouped in expert group and then discuss their part in that group. After that, they come back to home team and teach her/his own part to other member in home team. In this model, each team member is responsible for mastering their part and then teaching that part to the other member inhome team.
- b. Cooperative learning Think Pair Share approach is a learning model that give more time to student to think and then answering and sharing with the other. In this model, teacher poses a question first, then individual students think about (and record) their answer. Individuals then pair with another student to share their answer. The teacher calls on individuals or pairs to share with the large group.
- c. Problem solving skill is skill that shown by student in understanding problem, arrange planning to solve problem, implement planning and re-evaluate or verification for all step that have been done