CHAPTER I

INTRODUCTION

1.1. The Background

Development of knowledge and technology and life demand of society has brought consequence for education to do some concord efforts to prepare students that are already for following competition and able to face some challenges of life that is complex enough.

> To make students ready to follow competition and able to face some challenges of life that are complex enough, is made Level of Education Unity Curriculum (KTSP) based on *Permendiknas* No. 22, 23, and 24 in 2006 and *Permendiknas* No. 6 in 2007 that apply learning system with competence basic, totally learning system, and learning system that attends differences of individual of students (Sutedjo, 2009).

To make totally learning system and learning system that attends differences of individual of students, government of education spends new rule for every schools to apply remedial teaching for students whose learning difficulty.

> According to Suen, (2007) children whose learning difficulty has psychology need that is same with other children. Several of these children may be less in organizing perception and understanding ideas that are abstract or concrete. This case happens because children have low recall, less motivation, less concern in doing something or it is caused by behavior problem. Besides self of children, learning difficulties also can be caused from out self of children for example background of family, condition of school and their friends.

Causes of learning difficulties of children must be understood by teacher, therefore the precise learning approach that can be adopt suitable with children's need. Students having low learning result must be strived to increase their learning result, by repairing teaching strategy, learning method or other things that support executed teaching, hence students will be stimulated to study and to have progress in the better learning result.

> According to Pramudji, (2008) is needed remedial teaching because in teaching-learning activity, every students have rights to get satisfying learning result, but in reality every students have different ability. Matter of lesson will be easier to be understood by students having high ability, but students have low ability will need more long time in understanding matter of lesson. This case is caused every students consist different ability, capacity, background, and experience.

> According to Padakannaya, (2008) that children having learning difficulties if there is no handling from teacher, administration party, and headmaster, in a moment will be fail in getting higher education level. But if it is given remedial teaching will be possibility to be success.

Before doing procedure of remedial teaching, Supriyanto (2007), said that the steps that must be done namely are: 1) Analyzing case again; 2) Choosing execution alternative; 3) Giving specific service; 4) Remedial teaching execution; 5) Measuring again; 6) Re-evaluation and re-diagnostic. If teacher does the steps or procedures, then will be given various remedial teaching for every students having learning difficulties because it is accommodated with ability, capacity, background, and experience that are different from every students, consequently student's learning difficulty will be managed and can accelerate mastering the next matter.

In addition, students who have difficulty learning, especially in math according to Sriyanto, (2007) states that mathematics is often seen as a frightening specter by most students and for mathematics is likely to be perceived as a difficult subject. This resulted in low student mathematics learning outcomes. So that students do not complete the study. Students cannot achieve the mathematics passing maximal efficacy criterion established schools.

From the results of *TIMMS* (2003), suggests that the national exam test results mean and 4.00 until 5.00 in the *TIMSS* ranking Indonesia was ranked 34th of 38 participating countries. Given this reality, of course, is very alarming when compared with our neighboring countries such as Japan ranks third after Singapore and Korea. Wahyudin (1999) also found that the average level of students' mastery of mathematics tend to be low.

Another thing that contributed to low math learning outcomes are still many students who think that mathematics is a subject that is difficult and tedious. Students also did not realize that the mathematical skills that were grown in the learning of mathematics as reasoning, communication, connections, and solving math problems were contributed to the achievement of much-needed life skills of students in the real world where he lives and society.

In addition, mathematics as a basic science has an important role in science and technology was revealed in the curriculum (2004: 6) that the purpose of learning mathematics are developing the ability to convey information or communicate ideas, among others, through verbal discussions, charts, diagrams to explain ideas.

Kohler et al (1993) confirms that the interaction of teachers and students is important to say:

> Most would agree that could teaching and learning occur without texts, blackboards, or manipulative, but we maintain that the learning process would exist for only very few students or if classroom interactions with teachers and peers were eliminated. Teacher-student interactions are indeed the heart beat of the learning process.

The above explains that student interaction with teachers and peers is a very important role in teaching and learning. Thus, social interaction between teachers and students, pupils and students, individually or in small groups is a process that must be realized in communication learns and learning of mathematics.

Based observation has been done in SMP Negeri 1 Medan, students' mathematical communication ability are still low. Teachers tend not to question the ability to communicate as a basic competency in mathematics learning so comes the notion that communication skills cannot be established in the learning of mathematics. This assumption is certainly not appropriate according to the Greenes and Schulman (in Ansari, 2004). Due to the faulty assumption, ultimately in the implementation of the daily mathematics learning, teachers rarely give students the chance to communicate his ideas. Student’s activities are more passive during the learning takes place. It's resulted in students having difficulty in providing the correct and logical explanations for the answers. This is in

accordance with the opinion Cai, Lane, and Jakabcsin (in Ester, 1996) which suggests that students are rarely asked to argue in learning mathematics, the result is very foreign to them to talk about mathematics.

In learning mathematics, mathematical communication indicators according to NCTM (1989: 214) can be seen from:

1. Ability to interpret mathematical ideas through oral, written, and demonstrate it and draw it visually.
2. Ability to understand, interprets, and evaluates mathematical ideas both in oral, written, and in other visual forms.
3. Ability in using these terms, mathematical notations and structures to present ideas, describe relationships with models of the situation.

Above facts show that the learning process is applied at this time has not shown satisfactory results. Most teachers tend to use traditional or conventional model of learning, i.e. learning model that is more focused on the teacher while students tend to be passive. This makes learning such a poor student response to learning mathematics. More students accept what is delivered by the teacher. Such learning enables students to become less active.

Learning models which are supposed to increasing communication skills and also be able to overcome the difficulties of student learning is cooperative learning. In cooperative learning, students will be more active due to a process of discussion or interaction among students in the group. Through discussions, conversations in expressing mathematical ideas can help students develop the mind, therefore students involved in the differences of opinion or a solution of a problem will understand mathematical concepts better and can improve communication skills and be able to overcome the mathematical difficulties of student learning. This is in line with the opinion of Ansari (2009) which says that one of alternative of innovative learning that is expected to develop communication skills and the process of interaction between students and students' learning difficulties can be overcome is learning model class discussions.

One of the techniques of cooperative learning is learning by peer tutoring techniques. This technique is suitable with Mary (2000) said that peer tutoring is a

new way of involving students had increased their motivation, participation, real communication, in-depth understanding, their sense of responsibility for their own learning, and their commitment to the course, as well as their self confidence and respect for each other, the number of language skills and strategies they were able to practice and develop, and their language accuracy.

From this statement can be said that peer tutoring can help students namely students having learning difficulties or do not success to get maximal efficacy criterion of mathematics subject (students must get remedial teaching) in mathematical communication. So it will make students be success to get maximal efficacy criterion that school has specified as a minimal value standard of mathematics subject. It is similar to Melissa's opinion (2005) that peer tutoring will increase student engagement (15%-35% with teacher only to 46%-75% with peer tutoring).

Peer tutoring can be done by peers who are smarter, providing learning assistance to classmates in school. Aid learning by peers can eliminate the awkwardness. Language peers more easily understood, but it with peers no reluctance, inferiority, shame, and so on, so expect students who do not understand do not hesitate to express the difficulties it faces. Furthermore, Melissa (2005) says that students who struggle in specific content areas are paired with a higher performing peer to supplement teacher-led instruction. When pairs of student work together in a peer tutoring session, one student takes on the role of tutor while the other is the tutee. The flexibility of peer tutoring yields significant improvements for both tutor and tutee. For students with behavior problems, improvements have been found in academics, self esteem, attitude toward school, and peer relation.

While peer tutoring is defined as a method of cooperative learning based on the creation of students with an asymmetrical relationship and sharing a single common goal, which is known and shared and must be achieved through a relationship frame worked planned by the teacher (Monero and Duran in Duran, 2010). So it can be done by making students that have passed in examination or have been success in getting maximal efficacy criterion that school has specified

as a tutor for their friends that have not been success in getting maximal efficacy criterion yet for mathematics subject with teacher's guidance.

It is similar to Ischak and Warji in Siti (2012) said that peer tutors are students who have completed a bunch of material, provide assistance to students who have difficulty in understanding the lessons learned material. Then, Goodlad and Hirst in Melissa (2005), says that peer tutoring involves student helpers or tutors assisting in the learning process and helping other peers to learn by teaching.

From the experts say above, it can be concluded that peer tutoring can help students to increase mathematical communication to interpret mathematical ideas through oral, written, and demonstrate it and draw it visually.

But, not all students including the tutors can explain mathematical communication as draw the mathematical idea well. This is caused school especially teachers do not use media that can enhance students' mathematical communication skills, especially in mathematics learning namely in subject the surface area of the upright prism and the upright pyramid to manage students that have learning difficulties. For making students easier to communicate it, it can be helped by using mind mapping as a media in remedial teaching by peer tutoring technique. In addition, John (2003) said that some cooperative learning likes as peer tutoring for ensuring that all of the group members are actively engaged.

And based on interviewing with mathematics teacher in eighth grade of SMP Negeri 1 Medan that teacher did not use media namely mind mapping in teaching-learning process especially in subject the surface area of the upright prism and the upright pyramid. Then teacher just did conventional teaching in classroom where teacher as a centered of teaching-learning process without fully developing and applying various types of approaches and teaching methods in teaching and learning activities

Then, according to Britt (2011), a mind mapping is a diagram used to represent words, ideas, tasks, or other items linked to and arranged around a central key word or idea. Mind maps are used to generate, visualize, structure, and

classify ideas, and as an aid to studying and organizing information, solving problems, making decisions, and writing.

Then, in mind mapping, it can be seen the relationship between one idea with another idea. This is very brain makes it easy to understand and absorb the information. It works similar to how the connections in the brain. In addition, mind maps also allow us to develop the idea because we could start with a main idea and then use connections in our brains for ideas to break it down into more detail, (Susana, 2010).

From the explanation above, can be said that mind mapping is a media that is suitable for student's mathematical communication by performing students as a tutor for the other students having learning difficulties or have not gotten maximal efficacy criterion yet that school has specified it.

Based on analysis above, then need to do research that the title is " The Differences of Mathematical Communication Ability of Students through Remedial Teaching of Peer Tutoring Using Mind Mapping and Conventional Remedial Teaching in SMP Negeri 1 Medan Learning Year 2011/ 2012".

1.2. Problem Identification

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

1. Student's mathematical communication ability is still low.
2. Student's activities are more passive during the learning takes place.
3. Teachers have not fully developed and applied various types of approaches and teaching methods in teaching and learning activities.
4. Less cooperative methods applied by teachers in the learning of mathematics, especially in subject the surface area of the upright prism and the upright pyramid.
5. Teachers do not use learning media like mind mapping in mathematics learning.

1.3. Problem Limitation

Because of some limitations namely for aspect of time, knowledge, ability, and fund had, so it needs to bound problems in this research to get precise target according to expectation, then limitation of the study is "The Differences of Mathematical Communication Ability of Students through Remedial Teaching of Peer Tutoring Using Mind Mapping and Conventional Remedial Teaching in SMP Negeri 1 Medan Learning Year 2011/ 2012".

1.4. Problem Formulation

Problem formulation in this research is:

1. Is there the difference of student's mathematical communication ability through remedial teaching of peer tutoring using mind mapping with student's mathematical communication ability through conventional remedial teaching?

1.5. Research Objective

Together with problems, then research objective of this research is:

1. To know the difference of student's mathematical communication ability through remedial teaching of peer tutoring using mind mapping with student's mathematical communication ability through conventional remedial teaching.

1.6. Research Benefit

1. For Researcher
    - Give information about student's mathematical communication ability through remedial teaching of peer tutoring using mind mapping.

- Give information about student's mathematical communication ability through conventional remedial teaching.

2. For Teachers

   - Provide an alternative model of mathematics remedial teaching to be developed for the better so that it can be one of the efforts to improve student learning outcomes.

3. For Students

   - Provide new experiences for students and encourage students to engage actively in the learning of mathematics in the classroom.
   - To improve mathematical communication skills
   - To make learning math become more meaningful and useful.

1.7. Operational Definition

Given terms limitation in the title "The Differences of Mathematical Communication Ability of Students through Remedial Teaching of Peer Tutoring Using Mind Mapping and Conventional Remedial Teaching in SMP Negeri 1 Medan Learning Year 2011/ 2012" to avoid wrong interpretation towards to this research title. The terms need to get clear meaning is:

- Mathematical communication ability is: (i) Able to understand, interpret, and determine mathematical ideas through writing. (ii) Able to express mathematical ideas through writing and draw it visually. (iii) Developing conjectures, developing arguments, formulating definitions, and generalizations.
- Remedial teaching is a form of teaching that has characteristics to heal or to adjust or to make be better. So this remedial teaching is special form of the meant teaching to heal obstacles that happen in learning-teaching process.

- Peer tutoring is one model of cooperative learning where smarter students can help another students having learning difficulty. In this research, students are playing role as a tutor are students that have gotten maximal efficacy criterion, and students as a tutee are students that have not gotten maximal efficacy criterion yet.
- Mind mapping is a diagram used to represent words, ideas, tasks, or other items linked to and arranged around a central key word or idea. Mind mapping is used to generate, visualize, structure, and classify ideas, and as an aid to studying and organizing information, solving problems, making decisions, and writing.