

CHAPTER I

INTRODUCTION

1.1. Background

Words of education, counseling, teaching, learning, and training are technical terms concerning to activities united in educational activity. Education is one of the basic needs for human life, because through education human can change a person's attitude and ethics code in daily life. According to Sumber Referensi Online (2012), "education is the process of changing attitudes and ethic code of a person or a group of people in effort to human mature through the efforts of teaching and training; process, ways, manufacture."

Indonesia as a country gives much attention toward education in the development of the nation. Education is considered to be a main tool to build the next generation of the nation. As written in UU RI No.20 in 2003 on National Education System Chapter I Article I:

Education is defined as a conscious effort and deliberate to create an atmosphere of learning and the learning process so that learners are actively developing the potential for him to have the spiritual strength of religious, self-control, personality, intelligence, noble character, and the necessary skills themselves, society, nation and country.

Mathematics as one of the fundamental science education develop in people's life's and very needed in the development of science and technology. As stated by Cornelius (in Abdurrahman 2003: 253), that five reasons for studying mathematics : (1) a means to think clearly and logically, (2) a means to solve the problems of everyday life, (3) the means to know the patterns of relationships and generalization of experience, (4) the means to develop creativity, and (5) means to raise awareness of cultural development.

Cockcroft (1982: 1-5) stated that: "Mathematics should be taught to students because of (1) Is always used in our life, (2) All fields of study require appropriate mathematical skills, (3) As a powerful means of communication, concise and unambiguous, (4) Can be used to present information in a variety of

ways, (5) To increase the ability to think logical, accurate and spatial awareness, and (6) Give satisfaction toward effort to solve a challenging problem."

According to Satria (2012), quality of mathematics in Indonesia is still unsatisfied. Based on data from UNESCO, mathematics education quality in Indonesia was ranked 34 of 38 countries surveyed. Other data showing that students mathematics achievement in Indonesian still low, it's can be seen from the results of National Center for Education Statistics in 2003, toward 41 countries in mathematics learning, where the rank of Indonesia is 39 below Thailand and Uruguay.

In addition, the data obtained by World Competitiveness Year Book: "From 1997 to 2007 education in Indonesia is in the following order in 1997 from 49 countries studied rank of Indonesia is 39. In 1999, of the 47 countries surveyed Indonesia was ranked 46. In 2002 of the 49 countries surveyed Indonesia was ranked 47 and in 2007 of the 55 countries surveyed, Indonesia got ranks 53, stated by Asri (2009). Then based on the TIMMS, "junior high school students' mathematics abilities in Indonesia was ranked 35th of 46 countries. In science, Indonesia ranked 37th of 46 countries", stated by Sea (2004). So far, Indonesia has not been able to escape from under the board row.

The object of mathematics is abstract. So, often students always have difficulties to learn concepts, principles and existing operations in mathematics. Students difficulties in learning mathematical concepts is one of the important factors of student learning. Students get difficulties in learning mathematics concepts can effects to students' mathematical low scored.

One focus of teaching mathematics today is to increase students' mathematical problem solving skills through learning begins from an experience of students that occurred in daily life. But in fact, many students have difficulties in solving mathematical problems. Students always have difficulties related to problem solving. Problem solving is part of the mathematics curriculum which is very important because in the learning process and completion, enabled students to gain experience using knowledge and skills already owned to apply to solving problems that are not routine.

Researchers also conducted an initial test to the students of grade VII in SMP Negeri 6 Medan. The test is given in the form of initial ability test in the form of essay to see the students' ability to solve mathematics problems. Here is it problem/question in problem solving ability that given to students.

Mr. Budi's build a house shaped like trapezoidal. Known trapezoid $PQRS$ with $PS \parallel QR$ and $\angle P : \angle Q : \angle R = 5 : 7 : 8$. Determine large $\angle R$ of Mr. Budi's house.

Results obtained from these test is out of expectations. From 37 students there is no student have correct answer. Among them 58.8% of understanding problem still low and there is no student can apply the planning and solve the problem, so from this conclude that students problem solving ability still low.

Based on the test results can be known difficulties experienced by students in solving problems initial ability test between a lot of students that have difficulty in determining the mathematical concepts that will be used in solving a problem, students have difficulties in relating the known with asked of problem and many students have difficulties in letting convert sentences problem into sentences about mathematics (modeling). In each step problem-solving activities in the ability of students categorized as very low, therefore the overall take conclusions, students in problem solving is low.

From the survey results obtained by World Competitiveness Year Book, we can conclude that learning outcomes of student in Indonesia still disappointed especially in mathematics. This is possible because students are less able to understand the concepts and principles that effects to students not able to solve mathematical problems. Cause of student's difficulties in understanding of various concepts and principles of mathematics is a strategy or approach used by teachers that less variation, in teaching process just focus on text book, only provide information formula followed by giving questions, so that students feel satisfied, and effects to achievement of learning outcomes of students is not optimal. As expressed by Djamarah (2011:239):

Some of the causes of students' difficulties in learning are less good private teacher; teachers are not qualified, either in the use of method or control

subjects were held; relationship of teacher with student is less harmonious; teacher give lesson standard above of the ability of student; teachers do not have the skills in an effort to diagnose the learning difficulties of students, and the way of teacher teach is less good.

Based on the initial observation (February 18, 2013) implemented at SMP Negeri 6 Medan, curriculum that used in schools is Kurikulum Tingkat Satuan Pendidikan (KTSP), but the lesson is still using the old pattern (direct instruction in the classical style that is giving examples, one-way interaction, and the sometimes teacher asked students to answer, giving the task at home). Researchers did not find students learn in groups. Activities of students during learning activities are listening to the teacher's explanation, noting the things that are important. Students are afraid to ask the teacher although given the encouragement and motivation. Clever students prefer to work alone. Teachers train students working on routine problems (using formulas and rules that exist in the material being taught). Teachers less attention to the development of student learning, and often do not relate to students' prior knowledge with new material that is being taught. Learning tends not meaningful for students, indicated less active of students in learning process.

The researchers also conducted interviews with mathematics teacher's (Mrs. Ermas Napitupulu S.Pd) said: "In the process of mathematics learning most students are not active, rare among them want to ask, or give feedback. If given problem solving related with word problem in daily life, the values obtained by the students tend to be lower than about objective ". From the answers given student can be seen that most of the students find it difficult to interpret the given problem into mathematical form. In addition, students also have difficulties in determining the mathematical concepts that can be used to solve a given problem. They tend to conclude to perform arithmetic operations on numbers that exist in terms of word problem without understanding and thinking about what is required in the problem.

Based on description above take conclusion in mathematics learning process rarely related with daily life, even if students have learned the concept of

the learning material but the students still have difficulty to use knowledge to solve mathematical problems related to daily life.

There are some problems experienced by students in VII class in learning mathematics, especially rectangles based on the observation, students' understanding of concepts that are still low, and the difficulty of the students in the use of concepts learned in solving mathematical problems in the subject quadrilaterals. Realizing it required an effort to increase students' understanding of mathematical concepts in daily life. To overcome these problems is appropriate to use realistic mathematics learning approach. According to Hans Freudenthal (in Wijaya 2012: 20) realistic mathematics learning approach is "mathematics is a human activity." Statement "mathematics is a human activity" shows that Freudenthal not put mathematics as a ready product, but rather as a form of activity or process. According to Freudenthal mathematics should not be given to students as a ready product that is ready to use, but rather as a form of activity in constructing mathematical concepts. Freudenthal familiar with the term "guided reinvention" as the students are actively committed to rediscover a mathematical concept with teacher guidance. Furthermore, do not put mathematics as a closed system (closed system) but rather as an activity called mathematize.

A realistic problem is not necessarily a real-world problem and usually found in daily life of students. A problem called "realistic" if the problem can be imagined (imaginable) or real in the student's mind (Wijaya 2012: 20-21). Realistic problem presented by teacher at the beginning of the learning process so that the idea or mathematical knowledge can appear from the realistic problems. During the process of solving realistic problems, students will learn problem-solving and reasoning, in the discussion the students will learn to communicate. The results obtained during the learning process will be easy to remember because mathematical ideas students find themselves with the help of the teacher. In the end, the students will have respect for mathematics because with realistic problems related to real life day-to-day learning process of mathematics not directly to the abstract form so that students are motivated to learn mathematics and develop their ideas and solve problems in mathematics. Using realistic

mathematics education starts from a realistic problem is expected that students will be able to construct their own understanding and will make learning more meaningful so that students' understanding of the material more depth that would be beneficial to enhance the ability in problem solving.

The relevant research toward research conducted by Laily Rahmi. From the research conducted there are significant differences problem solving abilities of students who are taught using realistic mathematics education taught by the ordinary model.

She concluded that after the study is done, it turns out to obtain more effective results for students. In other words, that makes the learning of students as subjects and their own initiative in learning activities and students' skills in solving problems experienced increase after the act. In general, students are learning to apply the learning process has a realistic mathematical problem-solving ability is better than before given the learning process. Overall, realistic mathematics education can be an alternative to improve students' problem-solving abilities.

Based on the description above that the problem-solving ability is the goal of learning mathematics is very important, and one of the lessons that can increasing students' problem-solving abilities is realistic mathematics learning approach. Therefore, researchers are interested in doing research with taking the title: **Efforts In Improving Students Mathematical Problem-Solving Ability Through Realistic Mathematics Education Approach On Subject Quadrilateral At Smp Negeri 6 Medan Academic Year 2012/2013.**

1.2. Problem Identification

Based on background above, can be identified some problems as follows:

1. Quality of mathematics education in Indonesia still low.
2. Mathematics teacher in SMP Negeri 6 Medan still use traditional approach (teacher centered) makes students as passive objects in learning process.

3. Mathematics teacher in SMP Negeri 6 Medan not uses realistic mathematics education approach in learning mathematics.
4. Students still low to apply concepts in solving mathematical problem.
5. Mathematical problem-solving ability of students still low.

1.3. Problem Limitation

Seeing many aspects of problems that identified over time and ability of researcher, so researcher need to give limitation toward the problem that will be analyzed, it's can be conducted more depth. Appropriate to problem identification above, so researcher just gives problem limitation about: efforts in improving mathematical problem-solving ability through realistic mathematics education approach on subject of quadrilateral.

1.4. Problem Formulation

Based on background, problem identification and problem limitation mentioned above, so the problem that will be analyzed in this research formulated as follows:

1. How level of students' mathematical problem-solving ability to solve problem after taught by realistic mathematics education approach on subject of quadrilateral seventh grade students of SMP Negeri 6 Medan Academic Year 2012/2013?
2. Is realistic mathematics education approach can improve students' mathematical problem-solving ability on subject of quadrilateral seventh grade students of SMP Negeri 6 Medan Academic Year 2012/2013?

1.5. Research Objectives

The objectives of this research are:

1. To know the level of students' mathematical problem solving ability to solve problem after taught by realistic mathematics education approach on subject of quadrilateral class VII SMP Negeri 6 Medan in Academic Year 2012/2013.
2. To know whether implementation of realistic mathematics education approach can improve students' problem-solving ability on subject of quadrilateral class VII SMP Negeri 6 Medan in Academic Year 2012/2013.

1.6. Research Benefits

After conducting research expected the result of this research can gives good benefits are:

1. For teachers, it can broaden the knowledge of realistic mathematics education approach in helping students solve mathematics problems.
2. For students, through realistic mathematics education approach expected gives positive learning attitude and creative in solving problems.
3. For researchers, it can increase knowledge for my selves, especially about development and needs of students, before entering the real learning process.
4. For schools, have benefit to take right decision in improving quality of teaching, as well as consideration or reference materials to improve student achievement especially in mathematics.
5. As a matter of information and comparisons to readers or other researcher are interested in doing similar research.

1.7. Operational Definition

To be able to perform quantitative research variables so variables are defined as follows:

1. Mathematical Problem solving ability in this research is the study result of students in solving problems based on quadrilateral material toward problem solving stages as follows:
 - Understanding the problem
 - Making a plan of completion
 - Implementing of a plan
 - Checking answer obtained
2. Realistic Mathematics Education Approach

Realistic mathematics education approach is a procedure used in discussing mathematics materials that have characteristics using context, model, students contribution, interactive activities, has related material between guided reinvention and progressive mathematization principles, learning phenomenon (didactical phenomenology) and self-developed model.