

## CHAPTER I INTRODUCTION

### 1.1 Background of Research

Mathematics is a science that has an important role in the formation of human resources. Through mathematics, humans are capable of critical thinking, logical, systematic and initiatives in response to the problem. Mathematics as a one of basic science, both its application and aspectreasoning, had a major role under the effort mastery of science and Technology. for that, school mathematics should be enabled vehicle to grow and develop reviewIntelligence, ability skills Personality And for review form students. Concomitant the development of science and technology, Development of Education shift.

The purpose of learning mathematics was explained well on the Regulation of National Education Minister (Permendiknas) number 22 of 2006 about the content standards, objectives mathematics in high school is that the students have capability:

1. Understand the concepts of mathematics, describes the relationship between concepts, and apply the concepts or algorithms in a flexible, accurate, efficient, and precise in problem solving
2. Using the reasoning in the patterns and nature, perform mathematical manipulations and make generalizations, compile evidence, or explain an idea or statement mathematics.
3. Solve problems that include the ability to solve problems, designing mathematical model, complete model, and interpret the obtained solution.
4. Communicate ideas with symbols, tables, diagrams, or other media clarify the situation or problem.
5. Has the nature appreciate the usefulness of mathematics in life, that has a sense of curious, attentive, and interest in studying mathematics, as well as a tenacious attitude andconfidence in problem solving.

Mathematics is viewed by students as a difficult and scary's subject even some students think that mathematics is not very meaningful. This is because during learning, students glued to memorize and use formulas to solve a mathematics problem without knowing the meaning of the learning that they obtained so the students' ability in mathematical problemsolving is still very low. The statement is in accordance with the results of the PISA (Programme for International Student Assessment) Mathematics in Indonesia in every year has declined. In PISA 2009, only 0.1% of Indonesian students are able to develop and work on mathematical modeling requires thinking skills in solving problems. Problem solving ability's low of students can be seen from the Trends in International Mathematics and science study (TIMSS) in 2011 in the fields of mathematics, grade VIII, Indonesia's ranks is 38 of 63 countries and 14 states in the survey (Kompas, December 14, 2012).

In daily life, we always face many problems. The problems, of course, not all of the mathematical problems, but the mathematics has a very central role in addressing the daily problems. This means that mathematics is required by everyone in daily life to help solve problems. *Salah satu dari lemahnya pendidikan di indonesia adalah proses pembelajaran* (Sanjaya, 2007). *Masalah pembelajaran tidak bisa dipisahkan dari lemahnya kemampuan pemecahan masalah siswa* (Sudiarta, 2006). identified the main factors that causes of the low of mathematics problem solving ability of students is learning that carried out has not been able to develop students' skills in communicating mathematical ideas precisely, understanding of mathematical concepts and solving mathematical problems.

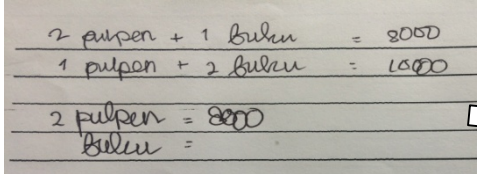
Problem solving is the heart of learning in solving mathematical problems. Solving problem in an effort to find a way out of a difficulty in order to achieve a goal that is not so immediately achievable (Polya). So, we need educators who are professional and have expertise in handling mathematical problem solving, in order to help students become better problem solvers. Learn about mathematics and mathematical problem solving is a process that is strongly influenced by the faith about mathematics. This faith determines how a student choose the approach

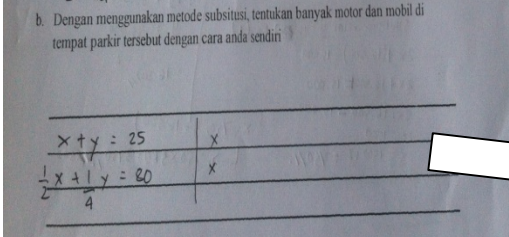
to the problem, and the techniques and strategies that will be used (Viholainen, Asikainen, & Hirvonen, 2014). Learning with mathematical problem-solving approach using mathematical skills and knowledge of students in solving mathematical problems which refers to Polya (1985), including understanding the problems, plan solutions, solve the problem according to plan, and re-check or looking back the results obtained.

Problem solving ability is one of the basic math skills that need to be owned by the students. In fact, a very important problem-solving skills in mathematics for problem solving abilities acquired in a teaching mathematics in general can be transferred for use in solving other problems in daily life.

Based on the results of the initial tests that have been implemented in the class X-IS 2 SMA Dharma Pancasila Medan, seen that students were still difficult to make planning problem and it is hard to make the final decision (conclusion). Especially when the student completed the initial test questions with indicators problem solving ability to draw conclusions. The followings are some of the mistakes of the workmanship solving the description:

**Table 1.1 The mistakes of student in problem solving ability diagnosstic tes**

No.	Result of students' answer	Analysis of students' mistake
1.	<p>Ika membeli dua pulpen dan satu buku seharga Rp.8000. Di tempat yang sama, Ray membeli sebuah pulpen dan dua buah buku seharga Rp. 10,000. Berapakah harga masing-masingsebuah pulpen dan sebuah buku?</p> 	<p>Students still haven't understood yet about planning that they do.</p> <p>Can't devise a plan so in the next step they will be wrong</p>
2.		

	<p>2. Pada tempat parkir yang terdiri dari motor dan mobil terdapat 25 buah kendaraan. Jumlah roda seluruhnya 80 buah. Jika banyak motor dinyatakan dengan <math>x</math> dan banyak mobil dinyatakan dengan <math>y</math>, sistem persamaan linear dua variabel dari pernyataan di atas adalah...</p> <p>b. Dengan menggunakan metode substitusi, tentukan banyak motor dan mobil di tempat parkir tersebut dengan cara anda sendiri</p> 	<p>For the number 2 of initial test, The students make incorrect asked and known</p> <p>Still didn't understand to write what is known and</p>
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Based on the initial tests, the obtained results show of 30 students, a total of 4 students who have reached the minimum completeness criteria, While 26 other students have not reached the minimum completeness criteria with an average grade of 38,23%. We can see for more explanation about the the percentage of problem solving ability in each indicator on the table below :

**Tabel 1.2 Table of The result diagnostic Test**

Problem solving ability Step	Percentage of Students
Understanding the problem	34,5%
Devising a plan	31,3%
Carrying out the plan	25,2%
Looking back	5,5%

Based on the data above, we know that the problem solving abilities of students is still low. This was seen when trying to resolve the matter, there were still many students who have difficulties. The place of student difficulties in resolving problems that have not been able to submit allegations, and many

students less accurate in the calculation so that the final decision (conclusion) be wrong. This shows that the students' mathematical problem solving ability is still low.

Based on the interview the researcher to the teacher about the material that has been and will be taught in particular on the material Statistics, there are still many students who do not understand the concept of the material, as well as most of the students had forgotten about material statistics that have been learned while sitting in Junior high school. From the interview of the researcher to the teacher, the teaching learning process in Dharma Pancasila Senior High School especially in class X-IS is still mainly focus to the teacher or conventionally. *Solusi dari permasalahan tersebut adalah dengan menerapkan suatu pendekatan pada pembelajaran matematika yang melibatkan siswa tidak sekedar aktif, tetapi ada aktivitas bersama di antara mereka* (Hadi, 2008). Math teachers should use learning approaches that can enhance learning mathematics among students.

One approach to teaching mathematics in which the problem solving ability can be used is Realistic Mathematics Education approach (RME). Realistic Mathematics Education (RME) is an approach to learning mathematics developed a pattern of reinvention guided in developing the concept through the process of mathematization, namely mathematics horizontal (media, facts, concepts, principles, algorithms and rules to be used in solving the problem) and mathematics vertical (the reorganization process in the world of mathematics through ratio and the development of mathematics). (Novikasari, 2007) said that *Pendekatan ini berhubungan dengan dengan pembelajaran matematika dalam kehidupan sehari-hari*. A realistic problem should not always be a problem (question) that exist in the real world, but the issue (problem) that can be imagined by the students. Learning mathematics with RME involve cooperation and discussion between members of the group to find and develop their own mathematical concepts and then use this discussion to solve problems individually or in groups. The benefits of realistics mathematics education as a media to improve mathematical problem solving ability is its contextual prolem, in the second phase of realistics mathematics education the students ask to describe the

contextual problem that they obtained. This is the one that can enhance problem-solving abilities in learning, especially in mathematics. Approach of Realistic Mathematics Education in mathematics learning is closely related to mathematical problem solving ability. This is in line with the theory of Realistic Mathematics Education Approach above, so that the learning of mathematics using RME approach can be associated with mathematical problem solving ability of students.

From the background described above, the authors interested in taking observations with the title: **The Application of Realistic Mathematics Education to Improve Mathematical Problem Solving Ability on subject Statistics in SMA Dharma Pancasila Medan A.Y 2016/2017**

### **1.2 Identification of Problems**

From the explanation and background are obtained, the identification of the problem is:

1. The ability of students mathematical problem solving is still relatively low.
2. Learning method still used oriented conventionally.
3. Most students still passive and not accustomed to express his own ideas.
4. The learning process are not using varied approaches in improving students' mathematical problem solving abilities.
5. Realistic Mathematics Education approach has not been being used.

### **1.3 Problem Limitation**

As described above, there are many problems that are identified, and it needs for a more focused restriction problems. Problems in this study only focused on "mathematical problem solving ability of students is still low and learning of mathematics is oriented mainly to the teacher (conventioanlly)".

#### **1.4 Problem Formulation**

Based on the background described above. The formulation of the problem in this study is:

1. How learning mathematics by using Realistic Mathematics Education approach can improve the mathematical problem solving ability of students in the class XI Academic Year 2016/2017?
2. How improving the problem solving ability of student XI IS 2 SMA Dharma Pancasila after applied by Realistic Mathematics Education on subject statistics?

#### **1.5 Research Objectives**

Based on the formulation of the problem above, the purpose of this study is: To improve students' mathematical problem solving ability by using realistic mathematics education on the material functions in the class X T.A 2016/2017

#### **1.6 Research Benefits**

1. For students

By applying realistic mathematics education, expected the students can improve the problem solving ability in mathematics.

2. For Teachers

Expected be input using varied approaches and helps to improve the rest of mathematical problem solving ability.

3. For Schools

Expected to be used as inputs in the innovation policy reviews related to school to improve the quality of teaching mathematics.

4. For Authors

This study is expected to be a positive feedback in preparing as a prospective educator.

### 1.7 Operational Definitions

The research titled is Application of Realistic Mathematics Education to improve the reasoning ability of students in class X SMA Dharma Pancasila A.Y 2016/2017. To avoid any misunderstanding, researcher gave an operational definition limits as follows:

1. Realistic Mathematics Education is a mathematical approach that utilizes reality and the environment experienced by students to launch the process of learning mathematics, so as to achieve the purpose of mathematics education is better than the last.

The steps of learning activities in Realistic Mathematics Education in this study are: (1) understand the issues / problems from contextual, (2) explain the contextual problem, (3) complete the contextual problems, (4) to compare and discuss answers, and (5) conclude.

2. Ability of problem solving is a high level of knowledge that requires a special skill in finding solutions to the problems faced by combining the concepts and rules that have been obtained previously, in order to obtain the path to reach a desired goal. With the following indicators:
  1. Understanding the problem
  2. Devising a plan
  3. Carrying out the plan
  4. Looking back
3. The ability of students' mathematical problem solving ability is said to be increased if at least 85% of the number of students who took the tests of mathematical mathematical problem solving ability reach a value of standart minimum criteria at least 75.