

CHAPTER I

INTRODUCTION

1.1. Background

Education is one of very important aspects of life. Giving the role of education is an effort to form a high quality human, then the problem of education in the spotlight, especially in Indonesia. One of the goals of national development in the field of education is the intellectual life of the nation and to improve the quality of Indonesian human. Through improving the quality of education at all levels of education, which enables its citizens to develop themselves as whole human beings Indonesia. To realize the national development in the field of education needed improvement and refinement of education in accordance with the development of science and technology (Science and Technology).

Mathematics is one of the basic sciences in school curriculum and must be learned in educational institutions. Based on the data above, Indonesia ranks are located in 39th of the 41 states and this must be very worrying. This problem must be improved immediately and be seriously handled because the usefulness of mathematics and very important both in development thinking, mastery of science and technology and its role in several other scientific subjects. It is also expressed by the Daniel Muijs and David Reynolds (2008: 332) which states mathematics is the main means for developing the ability of logical thinking and higher cognitive skills in children and plays an important role in several other scientific fields such as physics, engineering, statistics and others. Therefore, it is necessary teach students to mastery the mathematics early on creating, face and master modern technology for globalization era. Then, Cornelius in Abdurrahman (2003: 253) show several reasons for studying mathematics, namely:

1. Means of a distinct and logical thinking
2. Means to solve problems of daily life
3. Means to know the patterns, relationships and generalization of experience
4. Means to develop creativity
5. Means to increase awareness of cultural development.

Based on the above quotation through the learning of mathematics is expected that students can develop the ability to think, reason, develop creativity, communicate and present ideas and information and solve problems in daily activities. According to the National Council of Teacher Mathematics (NCTM) and its agenda for action in Alfred S. Posamentier Jay Stepelman (1990: 109) state that problem solving as primary goals for mathematics education and teacher are urged to:

1. Create a classroom environment and develop appropriate curricular materials in which problem solving can flourish
2. Give priority to identification and analysis of specific problem solving strategies
3. Develop examples of good problem
4. Encourage students to question , experiment, estimate, explore and suggest explanations

KEMDIKNAS 2006 in <http://pmat.uad.ac.id/perkembangan-pembelajaran-matematika-di-indonesia.html> then stated:

"The goal of learning mathematics, namely: (1) understand math concepts, explain the relationship among concepts and apply the concepts or algorithms in widely, accurate, efficient, and appropriately in problem solving, (2) using the pattern and characteristics of reasoning, mathematical manipulations in making generalization, arrange evidence, or explain mathematical ideas and statements, (3) solve problems that include the ability to understand the problem, design mathematical model, complete model and interpreting solution obtained, (4) communicate ideas with symbols, table, diagrams, or other media to explain the situation and problem, (5) respect of the usefulness of mathematics in life, which has the curiosity, attention, and interest in studying mathematics and a competent attitude and confidence in problem solving."

From the above statement, one of the aspects emphasized in the goal of learning mathematics is problem solving ability. It is very important because in solving the problem usually involves some of the concepts and skills in new situations or different that in the process possible the students' learning gain experience in using knowledge and skills to be applied in problem solving.

Learning of mathematics and its evaluation system have been less provides an opportunity for students to come up with ideas for students to learn mathematics. This is because learning is more focused on the teacher (teacher centered) are generally directly transferring his knowledge to students so that

students become passive. More emphasis on learning outcomes (product) in which students live using formula rather than emphasizing the process. Thus some actives to learn mathematic is to be trained in order to solve the problems.

This is also reinforced one of them by the results of *The Third International Mathematics and Science Study* (TIMSS) that the junior high school students in Indonesia are very weak, but pretty good *problem solving* in procedural skills. (Al-jupri & kartika). In addition Hudojo (2003: 152) states that teaching students to solve problems allow students to become more analytical in taking decisions for life. In other words if a student is trained to resolve problems, the students were able to make decisions for the students to have skills on how to gather relevant information, analyze information and realize the need to re-examine the results already obtained. But most of mathematics educators are concerned about the narrow focus of many schools programs, the limited treatment of content that they view as important for students, and the lack of attention given to developing in reasoning and problem solving (Lindquist, 1980: 9).

Furthermore, Tarwiyah (2011) explains that solving problems in mathematics learning is an approach and goals to be achieved. As an approach, problem solving is used to discover and understand the material and mathematical concepts. Meanwhile, as the goal, it is expected that students can identify the unknown elements, and asked the necessary elements of adequacy, formulating the problem of everyday situations in mathematics, implement strategies to solve problems (similar and new problems) within or outside of mathematics, describes the results as origin of the problem, develop a meaningful mathematical model. As the implications of the problem-solving skills should be possessed by all the children who learn mathematics. In learning process, students are passive, fearful, some are bored and some even feel that mathematics is a terrible lesson. In other words the students have not responded well to the challenges that exist in math. As a result, students are not able to be independent and do not know what to do. It can be concluded that the increase in students ability in solving mathematical problems have a considerable role for students. However, the

problem-solving is an activity in the learning process has not become a major activity so that there are many students who find it difficult when faced with problem solving.

Mathematical problem solving ability has get attention because it is a necessary capability in learning. Mathematical problem solving ability to encourage students in meaningful learning and togetherness, but it can help students in dealing with mathematical problems and issues of everyday life in general. Weak student math problem-solving ability is not out of lack of opportunity and not frequently students do problem solving. Mathematical problems presented in the classroom tend to routine problems. So that the students are not accustomed to solving problems in determining what is known and what is asked on the matter and to what to use.

The Causes of low mathematical problem-solving ability is due to intake of students who have previously not met the standards. Knowledge and experience of the material previously learned material will affect the learning process further. This is reinforced by Herman Hudojo statement that: "Studying the concept B is based on the concept of A, that person may not understand the concept of B. This means, learning mathematics should be gradual and sequential, and then based on their learning experience."

From the observation of the junior high school Al-Ulum Islamic Terpadu Academic Year 2012/2013, students tend not to like math because of lack of delivery of material related to everyday life so that academic concepts are difficult to understand. The teachers still teach and learn conventional learning models as a center of learning where the teacher (teacher cantered). Conventional learning gives effect to the inactivity of learning actors. Thus resulting to a total mastery of Mathematics and ultimately affect the competences and learning outcomes of students in mathematics.

One of the subjects of mathematics involved in this problem is Linear Equation of Variables system. Students have difficulty in learning the subject matter of linear equation of variables system, the majority of students are difficult to understand the concept of the linear equation of variables system. Students are

less able to translate the linear equation of variables system itself in everyday life. As the initial observations by the author on Islam Al-Ulum Terpadu in VIII class academic year 2012/2013 that most of the students were unable to resolve the problem concerning the complete linear equation of variables system. One problem, the ratio of rika and rido's money is 3:2, if the amount of their money is Rp.20.000, their money is the difference? Of course the problem can be regarded as a social arithmetic. But it would be better if we look as a problem in linear Equation of variables system. In linear equation of variables system, the problem above can be seen as a problem with two equations and two unknown variables. But in fact most students are not able to solve algebra problems thoroughly.

Based on these observations it can be identified that many mistakes which made by students at SMP VIII Al-Ulum Islam Terpadu Medan for solving problem of linear equation two variables system. caused by the weakness of students in aspects of pouring, declaring, disclosing, or making a model of ideas, mathematical concepts, and relationships among them into a new mathematical form variety in the form of words (written text), graphics, tables, diagrams, drawings, equations (mathematical expression), or a form of concrete (props) and use them in solving problems with the sort of things are known, asked, then answered.

In an effort to improve students' problem-solving skills, teachers should strive to train and familiarize students to the form of problem solving in learning activities, such as giving students the chance to hold a conversation in order to use the scientific opinions, conclusions or develop alternative solutions to a problem. Therefore, teachers need to select appropriate learning approaches to encourage students to learn to do math problem solving. Make learning math is boring and students do not think that mathematics is an abstract lesson in class, the teacher needs to choose a learning approach that requires an active involvement of students and also develop thinking skills by using the real thing around them, so that the learning objectives can be achieved. Learning math will head in the right direction and managed to find out if the characteristics of

mathematics. Mathematics has its own characteristics in terms of both aspects of competency to be achieved, as well as from the aspect of the material being studied to support the achievement of competence.

Realistic Mathematics Education (RME) is a learning system based on the philosophy that one will be able to absorb the subject matter if they can grasp the meaning of learning. RME is a comprehensive system that consists of five components, namely the contextual issues, modeling, production and contribution of students, interactions, linkages. If any parts of the RME intertwined with each other it will produce effects that exceed the results given in the parts separately and involve different processes as well, when it is used together to enable the students to make connections with each other produce. Learning mathematics using *Realistic Mathematics Education* approach (RME), which concerned local conditions (culture or environment or context) shows that students are not afraid to express their ideas, has begun to dare to give a different problem solving with their peers, grow their creativity in doing problem solving (*problem solving*) together.

The purpose of Realistic Mathematics Education is to solve the problems facing students by linking the material to the real world so that students can solve problems. This method is cooperative so to enhance cooperation among of student, all students are guided and directed to an active and creative condition so that the learning becomes more effective and efficient. Realistic Mathematics approach is expected to make the students know the importance of mathematics in everyday life. Learning innovations with Realistic Mathematics approach is expected to foster a new spirit to be more enterprising students to learn mathematics so that mathematical problem solving ability of students can be increased. Based on the above background, the writer is interested in doing research on "The Increasing of Problem Solving Mathematical Ability That Taught Realistic Mathematics Education Approach in VIII grade at SMP Islam Al-Ulum Terpadu of Medan Academic Year 2012/2013"

1.2.Problems Identification

Based on the background of problems it can be identified some problems, as follows

1. Teachers who taught using teacher centered make students as passive objects in the study.
2. Many mistakes which made by students in VIII grade at SMP Islam Al-Ulum Terpadu Medan for solving problem of linear equation two variables system.
3. The students are not yet accustomed to solve problems in mathematics learning in the classroom.
4. Realistic mathematical approach has not been implemented in the school, in general, teachers tend to prefer the conventional approach in teaching mathematics.

1.3.Problem Limitation

Seeing the wide scope of issues identified and comparing the ability of the researcher, the writer feels the need to limits the problems that are examined for the results in this study that can be performed and directed.

In this study the problem under study is limited to the influence of Realistic Mathematics Education for mathematical problem solving ability of students the subject of linear equation of variables system in VIII grade at SMP Islam Al-Ulum Terpadu Medan Academic Year 2012/2013

1.4.Problem formulation

Dictated by the above problems, the formulation of the problem in the study is "Is the increasing problem-solving mathematical ability of students that taught realistic mathematical education approach is better than the mathematical problem-solving ability of students taught by expository approach in VIII grade at SMP Islam Al-Ulum Terpadu Medan Academic Year 2012/2013."

1.5. Research Objectives

Based on the above problem formulation, the objective of this study is "To know the increased problem solving abilities of students that taught realistic mathematical education approach is better than the mathematical problem-solving ability of students taught by expository approach in VIII grade at SMP Islam Al-Ulum Terpadu Medan Academic Year 2012/2013."

1.6. Operational definition

So that the terminology in this study is more clearly so that the objectives and research directions to be is specific, then the variables are defined as follows:

- a. Realistic Mathematics Education is an approach to learning mathematics that has five characteristics: (1) using contextual problems as a first step, (2) using a mathematical model developed by students, (3) consider the contribution of students, (4) optimize the interaction with his students, students with teachers and other supporting facilities, and (5) consider the relationship between the topics.
- b. Expository approach is a procedure commonly used by teachers in teaching. The steps are the teachers prepare teaching materials in a systematic and organized, explaining the subject matter, students are given the opportunity to ask questions, students are given exercises that work on the problems of teachers, students and teachers discuss the exercise, then the teacher give homework.
- c. Problem-solving ability is the ability of students in solving mathematical problems by considering the process of finding answers based on problem-solving steps, namely: (1) understanding the problem, (2) making a plan strategy, (3) Carrying out the plan (4) Looking back or checking the answer.

1.7. Benefits of research

This study is expected to be useful:

1. As input material for teachers, especially SMP Islam Al-Ulum Terpadu Medan is a way to improve students' mathematical problem solving ability.
2. As input and consideration for prospective teachers in implementing the teaching and learning activities
3. As input for other researchers to conduct further research. RME learning implementation is expected to increase student learning outcomes for mathematics courses



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