**CHAPTER I**

**INTRODUCTION**

1. **Background**

The development of science and technology very rapidly in recent decades is something that cannot be separated from the role of mathematics. It could mean that individuals or groups who have high in mathematics skills would be also develop the science and technology, otherwise individuals and groups who have low in mathematics skills would be difficult to take part in developing it. This fact requires mankind who did not want to miss the current development of science and technology to learn mathematics.

Indonesian people surely did not want to miss to mastering science and technology, so that the Ministry of Education in Curriculum 2006 stated that the mathematics subject should be offered to all students from elementary schools. It is not an exaggeration, because by understanding and mastering mathematics, the Indonesian people are expected to master and participate in the development of science and technology, which in turn it would lead to progress and prosperity to Indonesia.

Constitution of Republic of Indonesia number 20, 2003 about the national education system Chapter X of Article 37 section 1 states that student who is at primary and secondary school must learn mathematics. Correspondingly, in the implementation of the national exam in 2003, mathematics became one of the subjects tested as well as determining the graduation of students, according to the Competency Standards (SKL) that compiled by the National Education Standards Board (BSNP). The statement indicates how the government encourages mathematics skills for students to realize the importance of having that capability.

Clere Lee (2006: 52) states *“Mathematics is a systematic seeking of patterns that can be used to concisely model the world. Algebra is a good example; the letters that pupils can find so confusing are often discussed as entities in themselves rather than as symbols that model the patterns of behavior of quantities*.”

The use of mathematics as a science of abstract objects and problems that associated with numbers, have significance in the lives of students. Cornelius in Abdurrahman Mulyono (2010: 251) stated five reasons for students to learn mathematics, because mathematics is (1) means a clear and logical thinking, (2) the means to solve the problems of everyday life, (3) the means to know the patterns of relationship and generalization of experience, (4) the means to develop creativity, (5) a means to raise awareness of cultural development.

For that in each lesson, students need to be equipped with sufficient knowledge of mathematics in order to solve mathematical problems related to the concept of everyday life. Through improving the quality of learning mathematics, students will be motivated to learn, growing creatively and critically, and to a better understanding of the material being studied.

As one of the factors that influence student success in learning mathematics understands the concept of students. According to the National Education Minister Regulation No. 22 of 2006 in math learning goals students are required to be able to understand mathematical concepts, explain the link between concepts and apply the concept is flexible, accurate, efficient, and precise in troubleshooting. With an understanding of concepts in mathematics learning students are expected to relate and apply it in everyday life so that what is learned will be more meaningful.

Sumarmo (Amrullah, 2014) suggested five basic capabilities that must be owned by the students after learning of mathematics, namely the ability of mathematical understanding, mathematical problem solving, mathematical reasoning, mathematical connection, and communicates mathematically. Based on the description above it is clear that one of the learning objectives to be achieved is mathematics mathematical understanding.

Understanding according to Hudoyo (Sri Indayani, 2015: 327) is a phase in learning activities. In this phase the students first received stimulus. This stimulus into the learning event and finally information (stimulus) that is stored in its memory.

Correspondingly, Winkel and Mukhtar (Nazulius Rs, 2014: 18) suggests an understanding of a person's ability to understand or comprehend something after something that is known or remembered; include the ability to grasp the meaning and significance of the material being studied, which is expressed by outlining the main content of a text, or change the data presented in some form to another form. So a learner is said to understand something when he can give explanations and emulate it using his own words.

According Marpaung quoted Qodri Ali Hasan (2012), the math does not mean anything if only memorized. Many students can refer to the definition of a parallelogram, but when they were given a rectangle and asked whether the rectangular parallelogram, they answer "no". This quote shows the failure of students to understand the concept, so that learning mathematics comprehension oriented noteworthy.

Anderson and Krathwhol in their book *A Taxonomy for learning, teaching and assesing: a Revision of Bloom’s Taxonomy of Educational* *Objectives* offer a *Two-Dimensional Framework.* A framework that distinguishes between types of knowledge learned (facts, concepts, procedural and metacognitive) with the type of cognitive process (remember, understand, apply, analyze, evaluate and create) with the aim to help educators to decide what needs to be taught.

From the description above, understanding is part of cognitive process, while students were learning science through the cognitive process is factual knowledge, conceptual, procedural, and metacognitive. The researcher found it and was interested to discover students' mathematical understanding based on the types of knowledge.

In connection with that, a variety of studies to uncover how students' mathematical understanding have been carried out. Sri Indayani et al. (2015), for example, they tried to uncover students' mathematical understanding in terms of emotional intelligence in grade VII MTsN Ketanggung, Ngawi. The results suggest students who have high emotional intelligence level of understanding were categorized in relational understanding that shown by the students have understood the process to solving mathematical problems and know the reason in doing the algorithm calculation. Being for students who have a low level of understanding of emotional intelligence is still in instrumental understanding shown by the students do not understand the reason why he was doing these calculations, students can only work on the problems of routine form.

Deni Iriyadi (2013) also has conducted research entitled searches understanding of mathematical concepts through self assessment in class XI IPA SMAN I Watampone and the results showed that the students' understanding of the concept is still low, particularly regarding the definition of limit. Students who otherwise would understand the concept of limit is marked with a bunch of ability to restate the concept, which includes examples and classify non-examples to the completion of the limit function and right results.

Statements about students' mathematical understanding were still low also disclosed by a mathematics teacher at SMPN I Tonra, Mr. Anggur Abdullah, S.Pd. Based on the interviews conducted, it was found that most students cannot convey the concept of the material that has been described by the sentence itself. In addition, most students cannot create a mathematical model of a given word problems. Most students cannot use certain concepts or procedures in solving a given problem. And the impact on the inability to conclude the material they have learned at the end of the lesson.

One of the lesson materials is still quite difficult to students is linear equation and inequality in one variable, especially in the using or determining of a symbol that is used as a variable, for example: "y is a number of days in a week". At the Linear Equations and Inequality in One variable that has been taught at previous semester, the value of evaluation test students on the material was very low. Most 75% of students do not reach completeness criteria in 60 point. The teacher guessed it was caused by the lack of students' understanding of the material.

From some of the description above and to know the truth of the phenomenon, the researcher intend to conduct a research related to the understanding of students based on three types of knowledge that were factual, conceptual and procedural subsequently entitled “*Profile of Students’ Understanding toward Linear Equations and Inequality in One Variable for Grade VIII student at SMPN I Tonra*”

1. **Problem Statement**

Based on the background of the problems that have been mentioned earlier, it was proposed a problem statement, how the descriptions of students’ understanding for grade VIII student at SMP Negeri I Tonra on Linear Equation and Inequality in one Variable related to factual, conceptual and procedural knowledge?

1. **Research Purposes**

According to the problem statement above, then the goal of this research was: To describe the understanding of students in grade VIII student at SMP Negeri I Tonra on Linear Equation and Inequality in one Variable related to factual, conceptual and procedural knowledge.

1. **Benefits of Research**

The researcher hopes the results of this study can provide considerable benefits to education, especially in mathematics learning, that were:

1. For Students

Provide motivation for students to more understand about mathematical equations, especially on linear equation and inequality in one variable.

1. For Teachers

Provide an overview of how the students’ mastery in understanding of mathematical equations especially on linear equation and inequality in one variable.

1. For other researchers

Provide information and experience to other researchers about the real problems in class learning. And can be used as a reference for further research that raised the research topics that are relevant to this research.

1. **Term of Limitation**

To avoid a double interpretation of the terms that used in this research, then should be given the term of limitation as follows:

1. Profile is a depiction or presentation of facts or circumstances that exist in a person.
2. Understanding is the ability of a person in linking knowledge schemes that fit into the scheme that has gained from previous learning experience.

Indicators of understanding, which are:

* Students change a description from one form into another form.
* Students find a specific example or illustration of a concept or principle.
* Students find something that is owned by a category
* Students abstracts common themes or main points
* Students describe the logical conclusion from the information that was presented.
* Students find a relationship between two ideas, objects or similar things.
* Students are able to construct a model of causality of a system.

1. Knowledge is an idea or information that was received by a person into cognitive scheme.
2. The factual knowledge is the basic elements that should be known to the students if they would learn disciplines or solve problems in the disciplines.

Factual knowledge indicators are: specific knowledge of labels or verbal and non-verbal symbols (e.g. words, numbers, signs, and pictures) that have specific reference

1. The conceptual knowledge is information or idea in mind appropriately to the problem solution, without knowing why these rules apply.

Indicators of conceptual knowledge:

* + Restates a concept
  + Classify mathematical objects based on their properties.
  + Give an example of a concept
  + Presenting the concept into various forms of mathematical representation

1. Procedural knowledge is knowledge of standard algorithms, and techniques in solving mathematical problems.

Indicators of procedural knowledge:

* + Students write down the steps in solving a mathematical problem.
  + Students explain the reason of any solution steps that have been written.

1. An indicator of students that chosen as the subject is able to communicate well.
2. The lesson material of linear equation and inequalities in one variable about: (1) understand the algebraic form, linear equation and inequality in one variable, (2) using the algebraic form, linear equation and inequality in one variable, and ratios in problem solving.