

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Britannica concise encyclopedia defined mathematics as “science of structure, order, and relation that has evolved counting, measuring and describing the shapes of the object. It deals with logical reasoning and quantitative calculation” (Gouba, 2008). Walle, Karp, & Williams (2010) also define mathematics as a science of concept and process that have a pattern of regularity and logical order. Reys, Lindquist, Lambdin and Smith (2007) had five views of mathematics as following: mathematics is a study of patterns and relationship, it gives students a way of thinking, it is an art that characterized order and internal consistency, it is a language that uses carefully defined terms and symbols and it is a tool that is used in the course of daily life. Therefore, Mathematics is more than counting number, it is all about finding and exploring the order, and then making sense of it.

People are facing the changing world. National Council of Teachers (2000) as cited in Walle, Karp and Williams (2010) stated that “In this changing world, those who understand and can do mathematics will have significantly enhanced opportunities and options for shaping their future” (p. 1). In addition National Research Council, noted that proficiency in simple algebra and geometry is either a prerequisite to a training program or as part of a licensure examination in over 75 percent of all jobs (2000).

In accordance with that, Andersen wrote an article in IT Magazine (March 2006) that listed some reasons why young man should study math, one of his ideas

is because they will meet math more and more in the future in all areas of work. For instance, he stated:

Future journalists and politicians will talk less and analyze more. Future police officers and military personnel will use more and more complicated technology. Future nurses and teachers will have to relate to numbers and technology every day. Future car mechanics and carpenters will use chip-optimization and stress analysis as much as monkey wrenches and hammers. There will be more math at work, so you will need more math at school. (Andersen, 2006)

The world needs people who can do math to meet the future needs. American Diploma Project estimates that “in 62 percent of American jobs over 10 years, entry-level work skill will need to be proficient in algebra, geometry, data interpretation, probability and statistics” (Hanushek, Peterson, & Woessmann, 2011). Similar with that findings, based on large-scale national studies of reading and mathematical skills of children and adults in Great Britain found out that:

For both men and women, poor mathematics skills were associated with lower rates of full-timer employment, higher rates of employment in low-paying manual occupations, more frequent periods of unemployment, and lower ability to take advantage of employer offered training and thus lower rates of promotion (Geary, 2011).

Therefore, it is necessary to learn math, so that people can compete and survive in the future global modern world.

According to NCTM (2000) as cited in Hatfield, Edwards, Bitter, & Morrow (2005) there are five mathematical contents that students should learn: number and

operation, patterns, function, and algebra, geometry and spatial sense, measurement, data analysis, statistics and probability and there are five standards that students should acquire and use their mathematical knowledge: problem-solving, reasoning and proof, communication, connection, and representation. Throughout these five important strands, five mathematical content and five standards that students should acquire in learning math, it will construct their way of thinking in such a way they can link ideas of the connected meaning, see the relationship among different pieces of information and incorporate new information into their prior knowledge. Therefore, it is necessary for students to master these five mathematical contents and acquire five standards of mathematical knowledge.

“In Indonesia, there has been a concerted effort to improve the quality of mathematics teaching and learning in classroom” (Widjaja & Dolk, 2015). As a proof of this effort, the implementation of mathematics curriculum is always changing. Soedjadi as cited in Sembiring (2010) divided mathematics curriculum development in Indonesia into several eras: (1) era before 1975, (2) mathematics modern era, (3) back to counting in 1990’s, (4) integrated periods. Now, Indonesia has been entering the integrated periods where mathematics is not only about counting and fulfilling the five important mathematical content as required in NCTM (2000), but also acquire the mathematical knowledge. Currently, Indonesia was using the 2006 Curriculum or *Kurikulum Tingkat Satuan Pendidikan (KTSP) 2006*. “KTSP is arranged, based on students’ potential development and needs for now and for future with the consideration of the local and national interest, and the global requirements with the spirit of the School-Based Management” (Falak, 2008). Therefore, the current mathematics curriculum that currently used in

Indonesia is also considering the local and national interest, so that it can prepare students to face the national or even the global expectations.

More than that, learning math is related to the human responsibility to reign over other God's creation as the Image-bearers of God. Genesis 1:28 stated "*Be fruitful and multiply. Fill the earth and govern it. Reign over the fish in the sea, the birds in the sky, and all the animals that scurry along the ground*". This verse is well known as the creation mandate. Brummelen (2002) stated that ruling and leadership in Scripture always involve service for the benefit of others. Therefore, God entrusts human as his co-regents with His creation in all its complexity so that all creatures will gain profit. Because God's creation is complex, then humans need to equip themselves with knowledge, and math is one of the knowledge that human should be fully equipped to do his responsible as God's co-regents in order to serve others.

Mathematics Learning Study Committee (2002) stated that mathematics proficiency develops over time, each year students ought to become increasingly proficient with both and new content. In accordance with this statement, Willis (2010) also stated that math progress is strongly based on foundational knowledge, thus, students need to achieve mastery in each topic. The topic that have mastered is the requirement to master other math topics that they are going to learn. Finally, mastering math is not only to get good scores, but it is also to prepare students to face the future modern world which needs people who are competent in math.

However, the researcher found out that there are some students who got low math achievement consistently in 7th grade in one of the private schools in Indonesia. Even more, among these three students, there was one of them who got

students record about math low achievement from their homeroom teacher in elementary school. The researcher also found out that their math score from 4th until 6th was also unstable. Based on the interview that was done by the researcher on these students' homeroom teacher, math teacher, and elementary teacher, these three students had been having difficulty in learning math, that is why they were always showing low math achievement (See Appendix J, K, and L)

In order, to help these three students achieve better results in math, teacher, parents and school need to give their hard efforts. However, before they can help these three students, they need to know how to help these three students, because each student might have a different background that can cause their low achievement in Math. Therefore, this study is going to identify some factors that cause the low achievement of these three students.

By identifying the factors that cause low math achievement, math teacher will be able to help these three students better. Then the proper handling for these three students will lead them to achieve better result in math. Thus in the future, they can compete in global modern world and more than that and moreover they can also maximize their competence in math to serve other God's creation.

1.2 Problem Statement

- 1) What are students' perceptions on their personal achievement, perception of teacher's goal orientation, perception of classroom goal structures, academic related perceptions, beliefs, strategies, and perception of parents' goal orientation?
- 2) What are parents' perceptions on students' mastery goals and students' performance goal?

- 3) What are 7th grade teachers' perception of the school goal structure for students, approaches to instruction, and personal teaching efficacy?
- 4) How do students', parents', and teachers' perceptions influence students' low math achievement at junior high school XYZ, Makassar?

1.3 Purpose of the Study

- 1) Exploring students' perception on their personal achievement, perception of teacher's goal orientation, perception of classroom goal structures, academic related perceptions, beliefs, and strategies, and perceptions of parents.
- 2) Exploring parents' perception on students' mastery goal and students' performance goal.
- 3) Exploring 7th grade teachers' perception of the school goal structure for students, approaches to instruction, and personal teaching efficacy.
- 4) Exploring how students' own perceptions of their personal achievement, parents' perceptions and teachers' perceptions influence students' low mathematics achievement at XYZ junior high school Makassar.

1.4 Significance of the Study

1.4.1 Math Teachers at the XYZ School

- Math teachers can recognize what they should do as a math teacher in order to improve these three students.
- For the math teachers in the next grade, they also can recognize what they should do to improve the ability of these three students in Math.

1.4.2 Parents

- This research may be used by parents, so they can recognize how important their roles in helping their children to be successful in Math.

1.4.3 School

- School can determine what programs that they can give to these three students to help them achieve better in Math.

1.4.4 Researcher

- Researcher as math teacher candidate will be prepared to handle students with the similar situation or challenge.

1.5 Definition of Terms

The following terms need defining for the current research:

- 1) *Low mathematics achievement*: Heller and Fantuzzo (1993) defined low achieving as “scores below the 50th percentile on standardized mathematics achievement scales” (Baker, Gersten, & Lee, 2002).
- 2) *Goal orientation theory*: “Goal orientations have to do with students’ reasons for engaging in academic task” (Anderman, Austin, & Johnson, 2002). Eggen and Kauchak (2007) stated that there are two types of goals, they are *mastery goal orientation* and *performance goal orientation*. Performance goal orientation is divided into two types also, they are *performance-approach* and *performance-avoidance*.
 - a. *Mastery goal approach* is individual hopes to achieve that focuses on mastery of a task, improvement, and increased understanding (Eggen & Kauchak, 2007, p. 312)

b. *Performance-approach goal* focused on competence or ability and receiving a favorable judgment from others (Eggen & Kauchak, 2007).

Performance-avoidance goal: “an attempt to avoid looking incompetent and being judged unfavorably” (Dai, 2000 as cited in Eggen & Kauchak, 2007, p.312).



