

CHAPTER I

INTRODUCTION

1.1 Background

Education is a systematic learning process and individual development that involves the transfer of knowledge, skills, values, and norms from one generation to the next, involving interaction between educators and learners. Education plays an important role in shaping an individual who is qualified, competitive, achieves the best potential in himself, and prepares to participate actively and positively in society. Through education, the people of this nation can be free from ignorance and downturn, because good education will be able to produce a generation of nations that are qualified and able to compete with other nations.

Based on *Undang-Undang dasar No. 20 of 2003*, Education is a deliberate and organized endeavor to create a learning environment and process in which students actively develop their potential for religious and spiritual strength, self-control, personality, intelligence, noble character, and the skills required for themselves and society. In the age of globalization, Indonesia urgently needs optimal contributions from its people. This is possible if all members of society are given the opportunity to obtain an education that allows them to develop their intelligence and skills optimally. One component of education that contributes to the development of science and technology is mathematics.

Mathematics is a universal discipline that underpins the advancement of contemporary technology and is crucial to numerous academic fields as well as the growth of human thought. Sujono in (Suwardi, 2014) states that mathematics is a science of logical reasoning and problems related to numbers. Learning mathematics aims to develop learners' understanding of mathematical concepts, improve their ability to think logically, and prepare them to face challenges in the real world. Mathematics education also encourages learners' ability to solve problems, think critically, and collaborate (Saefudin in Artikasari, 2017). In

addition, students are also required to be objective, honest, and disciplined in solving problems in everyday life.

One of the main measures of educational success is the learning achievement achieved in the field of mathematics. According to Djaelani & Mahfud in (Wirantasa, 2017) learning achievement is the mastery of knowledge and abilities obtained by topics, which are typically denoted by values or numbers.. The achievement of a student's mathematics learning objectives can be known from the student's own mathematics learning achievement, since learning outcomes obtained after completing the teaching and learning process are reflected in learning accomplishment. The mathematics learning achievement of each student can be known from the values obtained, for example, the mid-semester exam score, the final semester exam score, and the report card scores that students have achieved during one semester (Tarno in Wirantasa, 2017).

Many factors affect student achievement, namely external factors and internal factors. One of the internal factors that play a role in determining the achievement of students in education is intelligence. Intelligence is one of the psychological factors that is important in achieving learning achievement. Included in internal factors are maturity and growth factors, intelligence, training, motivation, and personal factors. While those included in external factors are family factors and household conditions, teachers and how to teach, resources for instruction and learning, the surrounding circumstances and opportunity, and social incentive (Purwanto in Zain et al, 2023).

Howard Gardner, a psychologist and professor of education at Harvard University, in 1983 Gardner create and developed the theory of multiple intelligences and applied it to the world of education after starting research on various types of intelligence in the early 1970s. Gardner (2011) in his book entitled *Frames of Mind*, mentioned there are nine types of multiple intelligences, namely (1) spatial intelligence, (2) logical mathematical intelligence, (3) verbal linguistic intelligence, (4) musical intelligence, (5) kinesthetic intelligence, (6) intrapersonal intelligence, (7) interpersonal intelligence, (8) naturalistic intelligence, and 9)

existential intelligence. Gardner mentions that it is not only monolithic intelligence that is important for success, but there is another spectrum of intelligence known as personal intelligence. This intelligence is named by Gardner as personal intelligence (intrapersonal and interpersonal), which Goleman knows as emotional intelligence. These intelligences are interrelated with one another.

However, according to the findings of my observations, during teaching assistency activities, which were carried out for approximately 3 months in the period 10 October – 12 December 2023, and the results of my interviews with mathematics teachers at MAN 1 Medan, there are three problems for students in learning mathematics. The first problem there are still many students who find mathematics lessons difficult, especially in thinking of problems in the form of visualization and images to solve and find the answer. The second problem is the lack of skills of students in solving mathematics problems. The third problem is that Students still find it difficult to cope with their anxiety and frustration when dealing with difficult matters and failure to solve maths so they tend to become desperate and lazy in learning if there are errors in the learning process involving themselves and others.

From the three problems above, it is evident that visual spatial intelligence is crucial for students, where visual spatial intelligence can improve students' imagination in visual form and the ability to understand images. In the second problem, students' logical mathematical intelligence is still not functioning optimally, so they are less skilled in solving math problems. In the third problem, it is clear that emotional intelligence is needed by students in order to control their emotions and recognize other people's emotions well so that they have high motivation and enthusiasm for learning and have good cooperation in the learning process.

Related to spatial intelligence, according to Armstrong (2017) spatial intelligence will show the ability of learners to understand the perspective of space and dimensions. Spatial intelligence helps learners understand abstract concepts, including spatial perception involving spatial relationships, including orientation,

and complex abilities involving mental manipulation and rotation. spatial intelligence requires left-right understanding, perspective understanding, geometric shapes, connecting spatial concepts with numbers, and the ability to mentally transform visual images. This understanding is very necessary when learning math. In general, people with spatial intelligence are able to form mental images and create graphical representations. They can think and recreate the visual world, understand direction, and think and plan things in the visual world.

Furthermore, Armstrong (2017) also states that logical mathematical intelligence is the ability to understand operational basics related to numbers and principles and the sensitivity to see patterns and relationships of cause and effect. Mathematical logical intelligence refers to a student's ability to count, measure, and do mathematical operations. This suggests that children who have high mathematical logic intelligence likely to be able to think rationally, solve issues, and comprehend concepts such as number, time, and causal linkages required in solving problems in mathematics.

According to Goleman (2006), emotional intelligence is a person's ability to regulate their emotions with intelligence, preserve emotional balance, and express them through skills of self-awareness, self-control, self-motivation, empathy, and social skills. Emotional intelligence includes different abilities but also affects academic intelligence. Without emotional intelligence, people will be unable to make full use of their cognitive ability.. Typically, people who score highly on emotional intelligence factors would be described as having a deep understanding of themselves, what their strengths or weaknesses are, and what makes them unique.

Previous research conducted by Jayantika & Trisna (2013), is about the contribution of spatial intelligence, logical mathematical intelligence, and numerical intelligence on students mathematics learning achievement SD Negeri in Kabupaten Buleleng, states that spatial intelligence and mathematical logical intelligence have a positive and significant effect on student mathematics learning achievement, which is 91.8%. Then research conducted by Azis (2021) which is about the effect of emotional intelligence on students mathematics learning

achievement SMP Negeri 1 Kapontori, states that emotional intelligence has a positive and significant effect on students' mathematics learning achievement. Emotional intelligence factors effected students mathematics learning achievement by 50.8%, while the remaining 49.2% is effected by other factors.

Based on the description above, this research focuses on spatial, logical mathematical, and emotional intelligence. The researcher would like to determine is there a effect and how much the effect of spatial, logical mathematical, and emotional intelligence have on the mathematics learning achievement of students grade XI MIPA in MAN 1 Medan. Therefore, the researcher will conduct a study entitled "The Effect of Spatial, Logical Mathematical, and Emotional Intelligence on Students' Mathematics Learning Achievement".

1.2 Problem Identification

From the background of the problems described above, the identification of problems that researchers take into account for this study is as follows:

1. Lack of students' ability to solve or find a problem in the form of visualization and images so that still many students who consider mathematics lessons difficult.
2. Lack of students' ability in solving mathematics problems, where students have difficulty answering problems in the form of stories because they cannot identify the problems.
3. Lack of students' ability to cope with their anxiety and frustration when dealing with difficult matters and failure to solve maths so they tend to become desperate and lazy in learning if there are errors in the learning process involving themselves and others.

1.3 Scope of Problem

In this study, the researcher examined the object of research on intelligence, including spatial intelligence, mathematical logic and emotional intelligence, and students' mathematics learning achievement. The scope of this research is only on

variables related to spatial intelligence, mathematical intelligence, and emotional intelligence in students that affect students' mathematics learning achievement.

1.4 Problem Limitation

Based on problem identification, this research focuses on spatial intelligence, mathematical logical intelligence, and emotional intelligence. To provide specific and focused direction in this study and to narrow the scope of the problem, the researcher limits the problem in this study to the effect of spatial intelligence, mathematical logical intelligence, and emotional intelligence together on students' mathematics learning achievement.

1.5 Problem Formulation

Based on the problem limitations above, the problem formulations in this study are as follows:

1. Is there an effect of spatial intelligence on the students' mathematics learning achievement?
2. Is there an effect of logical mathematical intelligence on the students' mathematics learning achievement?
3. Is there an effect of emotional intelligence on the students' mathematics learning achievement?
4. Is there an effect of visual spatial intelligence, logical mathematical intelligence, and emotional intelligence together on the students' mathematics learning achievement?

1.6 Study Objectives

Based on the problem formulation above, the objectives in this study are as follows:

1. To find out whether the spatial intelligence has an effect on students' mathematics learning achievement.
2. To find out whether the logical mathematical intelligence has an effect on students' mathematics learning achievement.

3. To find out whether the emotional intelligence has an effect on students' mathematics learning achievement.
4. To find out whether the visual spatial intelligence, logical mathematical intelligence and emotional intelligence together has an effect on students' mathematics learning achievement.

1.7 Research Purposes

Based on the research objectives, the expected benefits of this research are as follows:

1. For students

Informing students that spatial intelligence, mathematical logical intelligence, and emotional intelligence affect students' math learning achievement.

2. For teachers

As a consideration for teachers so that spatial intelligence, mathematical logical intelligence, and emotional intelligence can improve students' mathematics learning achievement.

3. For schools

We can offer good ideas into schools for information on spatial intelligence, mathematical logical intelligence, and emotional intelligence, as well as one of the solutions to improve student mathematics learning achievement at MAN 1 Medan.

4. For researchers

The results of this study are expected to add insight and experience, provide an overview for researchers as prospective teachers, and provide reflection material for researchers as prospective educators regarding the issue of spatial intelligence, mathematical logical intelligence, and emotional intelligence in improving students' mathematics learning achievement before entering the world of education so that they can prepare themselves to face students in the future.