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ANALYSIS EMOTIONAL INTELLIGENCE AS A PREDICTOR OF STUDENTS' MATHEMATICAL THINKING PROCESSES: INSIGHTS FROM SDN 1 PESANGGRAHAN

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ABSTRACT

This study aims to determine whether emotional intelligence can influence how students think when solving math problems in elementary school. Specifically, this study focuses on three main things, namely: (1) determining the level of students' emotional intelligence, (2) observing the relationship between emotional intelligence and students' mathematical thinking abilities, and (3) determining the role of teachers in helping students manage their emotions when learning mathematics. This study employs a qualitative descriptive approach involving four fifth-grade students from SDN 1 Pesanggrahan, selected based on high, moderate, and low emotional intelligence categories. Data were collected through observation, interviews, and documentation, then analyzed according to themes aligned with mathematical thinking indicators and Goleman's emotional intelligence theory. The results of the study indicate that students with high emotional intelligence tend to think more systematically and are able to reflect on their thinking processes, while students with moderate and low emotional intelligence tend to experience difficulties. This study highlights the importance of mathematics education that also cultivates students' emotional intelligence, as well as the need for teaching strategies that balance emotional and cognitive aspects at the elementary school level.

Keywords: emotional intelligence, mathematical thinking, elementary school students

INTRODUCTION

Education is the cornerstone of human life and the progress of a nation. At the elementary education level, mathematics is a core subject that not only requires mastery of the material but also advanced thinking skills and emotional resilience in the face of challenges. The mathematical thinking process, which involves understanding problems, developing strategies, solving them, and evaluating

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results, requires emotional stability and optimal self-regulation. While the role of emotional intelligence in supporting cognitive abilities has been widely recognized, research specifically examining its influence on the mathematical thinking processes of elementary school students, particularly in Indonesia, remains limited. This highlights a gap in the literature that needs to be addressed. Meanwhile, a number of studies abroad, such as in the United States and China, reveal that the ability to manage emotions is positively correlated with thinking resilience and the ability to solve complex problems (Zhao & Yang, 2020).

This study found that students with high emotional intelligence demonstrate more systematic, reflective, and efficient mathematical thinking. They are able to go through all stages of problem-solving with calmness and good self-control. Conversely, students with moderate or low emotional intelligence tend to experience difficulties in some stages of thinking, such as in designing strategies or evaluating results. These findings reinforce the results of Lestari and Hidayat's (2020) study, which shows that emotional intelligence plays an important role in the success of mathematics learning. Therefore, emotional intelligence can be considered an important indicator that predicts the success of students' mathematical thinking.

The purpose of this study is to determine the extent to which emotional intelligence influences the mathematical thinking process of elementary school students, describe their level of emotional intelligence, and explore how teachers play a role in helping students manage their emotions during mathematics learning. This objective is based on empirical findings that show differences in thinking performance based on students' emotional intelligence levels. By understanding the relationship between emotional and cognitive aspects more deeply, it is hoped that teachers and education practitioners can design learning strategies that are more responsive and tailored to students' needs.

Theoretically, this study refers to Goleman's (1995) concept of emotional intelligence, which includes five main dimensions: self-awareness, self-control, motivation, empathy, and social skills. These dimensions form the basis for analyzing how students recognize and regulate their emotions in learning activities. Meanwhile, mathematical thinking processes are analyzed using Polya's (1957) framework, which divides the problem-solving process into four main stages: understanding the problem, planning the solution, implementing the solution, and evaluating the results. The combination of these two frameworks provides a more comprehensive understanding of the interaction between emotions and thinking processes in mathematics learning.

This study also highlights the importance of the teacher's role in assisting students in managing their emotions. Teachers are not only responsible for transferring knowledge but must also be able to create a safe, enjoyable, and emotionally supportive learning environment. Mulyani and Prasetyo (2020) emphasize that teachers who are sensitive to students' emotional conditions can build strong learning relationships and enhance students' mental and emotional engagement. Through an empathetic

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approach, teachers can help students recognize their feelings, cope with learning stress, and develop reflective habits that support effective problem solving.

Thus, this study not only fills a gap in academic research in Indonesia but also provides theoretical and practical contributions to the world of education, particularly at the elementary school level. The three keywords in the research title emotional intelligence, mathematical thinking processes, and problem-solving are closely interrelated and analyzed in depth in the results and discussion. These findings emphasize that to cultivate students who are not only intellectually intelligent but also emotionally resilient, an educational approach is needed that integrates cognitive and affective elements in a balanced manner and in accordance with the students' learning context.

METHODS

Method This study uses a qualitative descriptive approach that aims to deeply understand the relationship between emotional intelligence and mathematical thinking of elementary school students. This approach is considered appropriate because it is able to thoroughly describe students' subjective experiences, such as their feelings and ways of thinking when facing math problems. Things like this are difficult to uncover through quantitative approaches (Creswell & Poth, 2018).

The study was conducted on four students in class V A at SDN 1 Pesanggrahan who were purposively selected based on their level of emotional intelligence (high, medium, low) and their ability in mathematics. The students selected were active participants in learning and did not have learning disabilities or special needs. The number of subjects selected was considered sufficient to obtain in-depth data and fulfill the principle of information saturation (Guest et al., 2006).

Data were collected using three main methods: direct observation when students worked on context-based math problems, semi-structured interviews that explored students' emotional experiences and ways of thinking when solving problems, and documentation in the form of student work and teacher notes. To measure emotional intelligence, a questionnaire developed from Goleman's (1995) theory was used, which includes five main aspects: self-awareness, emotional control, motivation, empathy, and social skills. In addition, observation and interview guidelines were prepared based on the stages of thinking in solving problems according to Polya (1957), namely understanding the problem, designing strategies, solving, and evaluating.

RESULT

The data in this study were collected through observation, interviews, and documentation of four fifth-grade students at SDN 1 Pesanggrahan who were grouped into three levels of emotional intelligence: high, medium, and low. Based on the observation results, students with high emotional intelligence (S1 and S2) were able to solve math problems by following all the problem-solving steps as described by Polya (1957), starting from understanding the problem, formulating a plan, solving it,

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and evaluating the results. They demonstrated emotional stability, organized thinking patterns, and the ability to reflect on the steps they had taken.

On the other hand, students in the moderate emotional intelligence category (S3) were able to solve most of the problems but often skipped the evaluation stage. Although they can understand the content of the questions and solve them technically, the strategies they use are inconsistent and easily disrupted by emotional pressure. As for students with low emotional intelligence (S4), they experience difficulties from the start of the task. They appear not to understand the content of the questions, lack a clear plan, and exhibit negative emotional reactions such as easily becoming frustrated and choosing to avoid the assigned task.

Tabel 4.1 Results of Mathematical Thinking Process Based on Emotional Intelligence Categories

Subjeck	EQ Category	Student Description	Problem Understanding	Problem-Solving Strategies	Problem Solving	Solution Evaluation
Student 1	High	Active, high-achieving, and confident student	Very good	Structured	Complete	Reflective
Student 2	High	Diligent, meticulous, and able to work well with others	Good	Systematic	Complete	Done
Student 3	Medium	Students are fairly active, easily influenced by the atmosphere	Fair	Inconsistent	Partially	Not done
Student 4	Low	Students are quiet, lack confidence, easily anxious	Weak	None	Not completed	Not done

DISCUSSION

The results of the study indicate that students with high emotional intelligence are able to think mathematically in a more effective and structured manner and are capable of reflection compared to students with moderate or low emotional intelligence. This is evident from their success in completing all stages of problem solving according to Polya, from understanding the problem, formulating a plan, solving it, to evaluating the final result. Meanwhile, students with moderate emotional intelligence showed inconsistent performance and often skipped some important stages. Students with low emotional intelligence experienced difficulties in almost the entire mathematical thinking process. This

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fact shows that the ability to manage emotions and the presence of internal motivation are key factors in solving mathematical problems well.

This finding aligns with Goleman's (1995) theory of emotional intelligence, which encompasses five main aspects: self-awareness, emotional control, motivation, empathy, and social skills. In the process of learning mathematics, these five aspects play a significant role in helping students cope with pressure, maintain concentration, and persevere when facing difficulties in thinking. Students with high emotional intelligence can generally calm themselves when encountering obstacles and remain motivated to solve problems in a planned manner. Conversely, students who struggle to regulate their emotions are more likely to lose focus and unable to develop effective problem-solving strategies.

1. Overview of Elementary School Students' Emotional Intelligence Levels Based on High, Medium, and Low Categories

The emotional intelligence levels of students in this study show clear differences. Students in the high category demonstrate the ability to recognize and understand their own emotions as well as those of others. They appear confident, enthusiastic, and able to manage their emotions in a positive way, including when faced with difficult math problems. This ability allows them to remain calm, focused, and able to complete the mathematical thinking process in its entirety, from understanding to evaluating answers.

Conversely, students in the low emotional intelligence category showed difficulty in managing emotions such as fear, anxiety, and frustration. This resulted in a lack of concentration and effectiveness in completing tasks. They tended to give up quickly, avoid tasks, and were reluctant to try other strategies when encountering difficulties. Uncontrolled negative emotions hindered their ability to think logically and directly impacted the problem-solving process.

The results of this study are in line with the study by Putri and Suryadi (2020), which states that students with high emotional intelligence are more adaptable and have good emotional stability, making them more engaged in learning. Another study by Wibowo and Yuliana (2020) also shows that the ability to regulate emotions significantly influences the success of critical thinking and problem-solving, particularly in mathematics learning. Therefore, the level of emotional intelligence is an important indicator for understanding differences in mathematical thinking abilities among elementary school students.

2. Analysis of the Relationship between Emotional Intelligence and Mathematical Thinking Processes in Students' Ability to Solve Mathematical Problems

Emotional intelligence plays an important role in supporting students' mathematical thinking abilities. The ability to understand and control emotions is fundamental to maintaining concentration, perseverance, and emotional stability when working on challenging mathematical problems. Students

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with high emotional intelligence are typically able to follow all stages of mathematical thinking in a systematic manner, from understanding the problem, developing a solution plan, solving the problem, to evaluating the results obtained. This evaluation stage demonstrates metacognitive awareness, where students not only focus on the final outcome but also evaluate the strategies used and assess their effectiveness.

Conversely, students with moderate or low emotional intelligence often struggle to maintain focus and easily feel overwhelmed when encountering difficulties. This impacts the organization of their thinking process, including strategy development and result evaluation. They tend to overlook important stages, particularly evaluation, resulting in an incomplete thinking process and less accurate answers. The inability to deal with pressure or failure calmly also makes it difficult for students to think logically and correct mistakes. Thus, emotional stability is an important factor in maintaining a systematic thinking process.

These findings support the statement by Wibowo and Yuliana (2020), who noted that emotional intelligence has a positive relationship with critical thinking skills, particularly in the context of mathematics learning. The ability to manage emotions not only strengthens mental resilience but also promotes reflective thinking and the use of more effective strategies. Additionally, these results align with the problem-solving stages outlined by Polya (1957), which include understanding, planning, solving, and evaluating. Therefore, it can be concluded that emotional intelligence is a key driving factor in the success of students' mathematical thinking.

3. The Role of Teachers in Guiding Students to Manage Their Emotions During Mathematics Learning, Especially in the Context of Problem Solving

Teachers play an important role in helping students manage their emotions during the learning process, especially in mathematics, which is often considered difficult by some students. In this study, students who received emotional support from teachers were more likely to overcome anxiety and frustration when working on math problems. Forms of support such as encouragement, praise, and constructive feedback were found to help students stay focused and more confident in facing problem-solving challenges.

An emotionally supportive classroom environment makes students feel safe, valued, and unafraid to make mistakes. When teachers create open and positive interactions, students feel more comfortable expressing their feelings, evaluating mistakes, and trying new approaches to solving problems. Mulyani and Prasetyo (2020) mention that teachers' sensitivity to students' emotional conditions can build strong learning relationships and increase students' intellectual and emotional engagement. This shows that teachers not only play a role in academic aspects but also as emotional companions during the learning process.

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Learning that prioritizes the development of emotional intelligence requires active involvement from teachers in instilling values such as empathy, self-awareness, and the ability to control emotions in various learning activities. Teachers can use methods such as reflective discussions, emotional journaling, or social interaction-based educational games as tools to help students become more attuned to their emotions. With this approach, teachers not only convey mathematical concepts technically but also help build emotional readiness that supports the thinking process. This emotional support from teachers creates a healthy and balanced learning environment that promotes the simultaneous development of students' cognitive and affective abilities.

CONCLUSION AND SUGGESTION

Based on the findings and discussion, it can be concluded that emotional intelligence plays an important role in determining the quality of students' mathematical thinking at the elementary school level. Students who have a high level of emotional intelligence tend to be able to solve math problems in a more structured manner, starting from understanding the problem, designing a solution, solving it, to evaluating it reflectively. In contrast, students with moderate to low emotional intelligence often experience obstacles in undergoing the process due to difficulties in controlling emotions and lack of inner drive.

In addition, the teacher's involvement in helping students regulate their emotions also has a major influence on their success in mathematical thinking. Forms of support such as providing motivation, an empathetic approach, and creating an emotionally comfortable learning atmosphere have been proven to improve students' concentration, resilience, and confidence in solving problems. Therefore, emotional intelligence cannot be separated from the learning process, especially in mathematics learning, and needs to be integrated as an important part of developing students' cognitive abilities in elementary schools.

Teachers are expected to incorporate the development of emotional intelligence into mathematics learning activities, for example through self-reflection activities, games involving emotional recognition, or open discussions on how to deal with learning challenges. Through these efforts, students can learn to recognize their emotions, regulate themselves better, and deal with learning pressure more wisely, so that the thinking process in solving mathematics problems becomes more optimal. Therefore, it is also important for teachers to receive training related to social-emotional skills so that they can be more responsive and understand students' emotional conditions.

For future research, it is recommended that the number of participants be increased and mixed methods be used to obtain quantitative data that can support the qualitative findings more strongly. In addition, it would be more meaningful if the research also examines other factors that play a role, such as the role of parents, classroom atmosphere, and the use of technology in supporting the development

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of students' emotional intelligence and mathematical thinking skills. This broader approach could contribute more to the overall improvement of learning in primary schools.

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