DOI: http://doi.org/10.5281/zenodo.22773620 SEPTEMBER 2026

An Examination of Elementary School Students' Achievement in Mathematics in Terms of Emotional and Motivational Factors

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Abstract

Low academic achievement remains one of the major challenges facing education systems today. The purpose of this study is to examine the relationships among the emotional and motivational factors believed to influence students' mathematics achievement. Accordingly, in this quantitative study conducted using a correlational research method, data collected from 265 elementary school students were analyzed. The study utilized measurement instruments whose validity and reliability have been established in the literature; the data were evaluated using descriptive statistics and Pearson correlation analysis. The findings revealed a significant negative relationship between math anxiety and performance. In contrast, significant positive relationships were identified between math self-efficacy and both math performance and enjoyment of math. Furthermore, it was observed that students who reported deriving a high level of enjoyment from mathematics also had significantly higher mathematics performance. These results demonstrate that students' mathematics achievement is closely related not only to cognitive factors but also to their emotional and motivational characteristics. In this context, the adoption of holistic educational approaches aimed at reducing students' math anxiety, strengthening their self-efficacy, and supporting the development of positive attitudes toward math can be considered an effective strategy for improving math achievement.

Keywords: Primary School Students, Anxiety, Self-Efficacy, Love Of Mathematics, Performance

1. Introduction

Mathematics is regarded as a fundamental component of education systems worldwide and is defined as a discipline that imparts skills related to logical reasoning, calculation, measurement, and quantities (Michael, 2015). Due to its practical contributions in daily life, mathematics is considered a core subject at primary and secondary education levels and serves as an essential gateway to various professional fields. In both developed and developing countries, mathematics instruction is an indispensable element across all educational stages (Umameh, 2011). At the societal level, mathematics is viewed as a foundational element for scientific and technological knowledge production and is considered a key factor in national socio-economic development.

Contemporary educational approaches emphasize mathematics as a central tool for enhancing individuals' analytical thinking, problem-solving, and synthesis skills (Gökbulut & Yumuşak, 2014). Moreover, mathematical proficiency is increasingly linked to a country's economic competitiveness and development level, thereby underscoring the strategic importance of mathematics education (Foley et al., 2017).

Despite the critical functions mathematics serves at individual and societal levels, mathematical deficiencies remain prevalent, particularly among children (Dowker, 2004). International assessments, such as the Programme for International Student Assessment (PISA), support this view. According to the 2022 PISA results, Turkey's average mathematics score decreased by one point compared to 2018. Additionally, Turkey scored below the OECD average in both mathematics and science, with a lower proportion of high-achieving students compared to OECD countries (MEB, 2022). This situation poses a significant challenge in achieving contemporary educational goals of cultivating individuals who think quickly, creatively, make effective decisions, and innovate (Kahramaner & Kahramaner, 2002). Considering the notable effects of mathematical skills on individual development, social welfare, and economic growth, identifying factors contributing to low mathematics achievement and understanding those that enhance success has become increasingly critical (Zivković et al., 2023).

Within this framework, affective and motivational factors, alongside cognitive abilities, play a decisive role in students' mathematics achievement (Giofrè et al., 2014; Putwain et al., 2021; Pellizzoni et al., 2022). Affective skills encompass various components such as self-efficacy, attitudes, interest, values, and beliefs, directly influencing students' learning approaches, motivation, and academic success (Hoffman & Schraw, 2009; Anderson & Krathwohl, 2001; Coelho et al., 2018). These components cover not only an individual's attitude toward learning but also emotional experiences and subjective evaluations. The inseparable nature of affective and cognitive skills (Tatar et al., 2013) and their holistic effects on learning are especially pronounced in cognitively demanding disciplines such as mathematics. Indeed, success in mathematics depends not only on intellectual capacities but also on psychological factors including emotional state, self-efficacy perception, interest in learning, and anxiety level (Pekrun, 2006).

Consequently, the systematic examination of affective and motivational factors influencing mathematics performance has become an important research area in contemporary educational sciences. Research conducted within this scope will contribute not only to students' academic achievement but also to the development of learners with stronger motivation.

2. Literature Review

This study aims to examine the relationship between students' mathematical performance and emotional and motivational factors. In line with this, a literature review was conducted, and various national and international studies on the subject were examined.

Research has demonstrated that high levels of mathematics anxiety negatively impact individuals' achievement regardless of their actual mathematical competence (Namkung et al., 2019; Zhang et al., 2019). Mathematics anxiety has also been reported to adversely affect students' performance, enjoyment of mathematics, self-confidence, and self-efficacy beliefs associated with confidence (Zirković et al., 2023). Studies conducted with primary school students indicate that mathematics anxiety significantly negatively affects performance even at this age group (Passolunghi et al., 2019). Furthermore, prolonged high levels of mathematics anxiety can lead to reduced employment

opportunities and diminished quality of life (Barroso et al., 2021). Mathematics anxiety also decreases students' motivation, disrupts cognitive processes, and impairs their information processing capacities. It is emphasized that anxiety often results in low academic achievement (Dowker et al., 2016). Ashcraft and Ridley (2005) and Ashcraft and Krause (2007) have noted that mathematics anxiety hinders students' ability to focus on problem-solving by adversely affecting working memory, which leads to performance decline. Mathematics anxiety is defined as an emotional component characterized by fear and worry triggered by mathematics-related situations and events, significantly affecting mathematics achievement (Ashcraft, 2002).

Among the affective factors influencing mathematics achievement, self-efficacy emerges as a particularly important motivational construct. Self-efficacy refers to an individual's beliefs regarding their capability to successfully perform mathematical tasks (Luttenberger et al., 2018). The literature frequently reports a positive and significant relationship between mathematics self-efficacy and academic performance (Zirković et al., 2023). Students with higher intrinsic motivation have been shown to engage more actively in mathematical learning and to be better prepared for encountered difficulties (Martin & Rimm-Kaufman, 2015). Self-efficacy is described as a strong psychological resource directly influencing students' engagement in learning, goal-directed persistence, and achievement levels (Lee et al., 2022). Usher and Pajares (2009) state that students' past mathematical experiences shape their current self-efficacy beliefs, and this relationship is bidirectional. Indeed, low mathematics proficiency can weaken self-efficacy perceptions, leading to the development of negative emotions toward mathematics and school in general (Du et al., 2021; Lee et al., 2022). Additionally, fostering mathematics self-efficacy can contribute to reducing students' anxiety levels (Rozgonjuk et al., 2020).

On the other hand, positive emotions such as enjoyment of mathematics are also significant factors influencing mathematics achievement. Studies show a moderate positive relationship between mathematics-related enjoyment and academic success (García et al., 2016; Herges et al., 2017; Pekrun et al., 2017). Enjoyment of mathematics enhances motivation toward learning, while negative emotions such as anger, anxiety, and frustration reduce performance (Forsblom et al., 2022). Raccanello et al. (2018) found that in research conducted across different cultural contexts, enjoyment of mathematics positively affected achievement. Students who feel inadequate when facing mathematical problems tend to develop more anxiety, whereas those who believe they are competent experience greater enjoyment and less anxiety (Forsblom et al., 2022). Positive emotions not only affect students' attitudes toward mathematics but also support their thinking and problem-solving processes, contributing to higher academic achievement (Pekrun et al., 2011). Feeling competent in mathematics facilitates students' enjoyment of the subject, and a significant relationship between these two variables has been established (Forsblom et al., 2022). In conclusion, mathematics anxiety is negatively correlated with achievement, whereas affective variables such as mathematics self-efficacy and enjoyment are positively correlated with success (Zirković et al., 2023).

When these findings are considered together, it becomes evident that the difficulties students face in mathematics should be addressed not only at the cognitive level but also at affective and motivational dimensions. Accordingly, a detailed examination of affective and motivational factors will enable the development of more comprehensive and effective interventions aimed at improving mathematics achievement.

2.1. Emotional and Motivational Factors

Emotional factors encompass psychological elements such as anxiety, stress, self-confidence, and academic self-concept that influence students' learning processes. Among these, mathematics anxiety is one of the most extensively studied variables. Mathematics anxiety refers to the intense tension and fear of failure experienced by individuals when confronted with mathematical tasks. High levels of this anxiety hinder students' efficient use of cognitive resources, thereby impairing performance (Ashcraft & Krause, 2007). Moreover, students with low academic self-efficacy tend to give up quickly when faced with difficulties, whereas those with high self-efficacy are more persistent in their learning efforts, increasing their likelihood of success (Zimmerman, 2000).

On the other hand, motivational factors relate to an individual's intrinsic or extrinsic motivation towards learning, goal orientations, achievement motivation, and learning strategies (Pintrich & De Groot, 1990). Intrinsically motivated students perceive understanding mathematics as an end in itself, while extrinsically motivated students tend to engage in behaviors focused on grades or rewards. Research indicates that students with higher levels of intrinsic motivation demonstrate more durable learning and achieve higher academic success (Deci & Ryan, 1985). Additionally, students who develop positive attitudes towards learning exhibit more advanced problem-solving skills and experience less anxiety towards mathematics (Middleton & Spanias, 1999).

2.2. Significance of the Study

Mathematics achievement is a multidimensional construct that cannot be solely explained by cognitive competencies. Particularly in domains that require abstract thinking, such as mathematics, affective and motivational factors play a significant role in determining performance. While mathematics anxiety negatively affects students' problem-solving processes, a high level of self-efficacy enhances their ability to cope with academic challenges. In this context, an in-depth examination of emotional and motivational components is of critical importance for developing pedagogical interventions that support academic success. Structuring educational policies and curricula with a holistic approach—one that addresses not only content delivery but also the affective needs of students—can significantly enhance the effectiveness of learning processes. Therefore, any educational initiative aimed at improving mathematics achievement must be designed with consideration of students' psychological and motivational characteristics.

2.3. Current Study

Considering the impact of mathematical competencies on individuals and society, understanding the factors that hinder students' mathematics achievement is of great importance. Although various studies in the existing literature address affective and motivational components, research examining both their positive and negative aspects together remains limited. Most studies have predominantly focused on negative emotions such as mathematics anxiety among primary school students; conversely, positive emotions like enjoyment of mathematics have been less explored. Mathematics self-efficacy is regarded as a significant motivational resource, and comprehensive investigation of both positive and negative affective factors influencing primary school students' mathematics achievement is necessary. Young learners often find mathematics less engaging and develop negative attitudes toward the subject; therefore, increasing research targeting younger age groups is imperative.

Furthermore, how students' mathematics performance is affected by affective and motivational factors constitutes an increasingly important research area within educational sciences and psychology. Examining these factors may contribute to the development of effective strategies aimed at reducing mathematics anxiety and preventing low achievement in the future. Accordingly, the present study aims to fill this gap in the literature. The primary research questions guiding this study are as follows:

1. What is the impact of affective and motivational factors on students' mathematics performance?

2. How do affective and motivational factors interact with each other in influencing students' mathematics performance?

3. Method

This section of the study covers the sample group, data collection tool, data collection process, data analysis methods, and findings obtained as a result of the analysis.

3.1. Research Model

This study is a quantitative study conducted using correlational methods to examine the relationship between emotional and motivational factors on students' mathematics achievement. Correlational research is a technique used to determine the direction and degree of relationships between variables (Creswell, 2012). This method is ideal for understanding whether relationships exist between variables and how strong they are, rather than establishing cause-and-effect relationships between them.

3.2. Study Sample

The research was conducted with 265 elementary school students attending elementary schools in the central district of Tatvan, Bitlis Province, during the spring semester of the 2024-2025 academic year. Among these students, there were 120 boys and 145 girls.

3.3. Data Collection Instruments

In this study, the Mathematics Anxiety Scale developed by Bindak (2005) was used to determine students' levels of mathematics anxiety. The scale consists of 10 items and is unidimensional. The items are answered using the options "Always," "Often," "Sometimes," "Rarely," and "Never." Participants rated their anxiety experienced in various mathematics-related situations on a scale from 1 (low anxiety) to 5 (high anxiety). The total score is obtained by summing the item scores and ranges between 10 and 50; higher scores indicate increased mathematics anxiety. The reliability coefficient of the scale in this study (Cronbach's α) was determined as 0.80.

The Mathematical Self-Efficacy Scale (Caprara et al., 2011) is a self-report instrument developed to measure individuals' perceptions of their self-efficacy in mathematics. The scale comprises 10 items, each rated on a 5-point Likert scale from 1 (not sufficient) to 5 (completely sufficient). The total score ranges between 10 and 50, with higher scores reflecting higher self-efficacy perception. The reliability coefficient of the scale in the sample was calculated as 0.80.

The Enjoyment of Mathematics Questionnaire (Pekrun et al., 2007) is a multidimensional self-report scale assessing students' positive emotions related to mathematics. This 10-item scale is rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total

score ranges between 10 and 50, with higher scores indicating increased enjoyment of mathematics. The Cronbach's α value in the sample was found to be 0.82.

Mathematics performance was assessed using a standardized test developed by Cornoldi et al. (2020). The test consists of three subtests: Fluency, Inference, and Written Calculation. The Fluency subtest includes 12 arithmetic operations involving addition, subtraction, and multiplication, and participants were asked to complete as many operations as possible within one minute. The Inference subtest contains 10 items with three different tasks and is completed within two minutes. The Written Calculation subtest comprises 6 problems involving addition, subtraction, multiplication, and division, to be solved within five minutes. The total number of correct responses constitutes the mathematics performance score. The reliability coefficient of this test (Cronbach's α) was determined as 0.78.

3.4. Data Analysis

The data obtained from the surveys used in the study were analyzed in detail using numerical data analysis methods and descriptive statistics. The data were found to be normally distributed, which justified the use of parametric tests. The calculated skewness and kurtosis coefficients are as follows: for Mathematics Anxiety, -0.87 and 0.17; for Mathematical Self-Efficacy, 0.45 and -0.39; for Enjoyment of Mathematics, 0.50 and -0.76; and for Mathematics Performance, 0.23 and -0.41. These values being between -1 and +1 indicate conformity to normal distribution (George & Mallery, 2010).

Descriptive statistics such as frequency, percentage distribution, arithmetic mean, and standard deviation were used to answer the main research questions. Analyses were conducted with a 95% confidence level ($p < .05$). For the first research question, the relationships among mathematics anxiety, self-efficacy, enjoyment of mathematics, and mathematics performance were examined using Pearson correlation analysis. For the second question, hierarchical regression analysis was performed to evaluate the predictive power of mathematics anxiety, self-efficacy, and enjoyment of mathematics on mathematics performance. All statistical analyses were carried out using SPSS 22 software.

3.5. Ethical Considerations

The research was conducted in accordance with the ethical guidelines established for studies involving human participants. Prior to data collection, approval was obtained from the ethics committee affiliated with the relevant institution. Participation was voluntary, and all participants were informed about the study's objectives, the confidentiality of the information they provided, and their right to withdraw from the study at any time. Written informed consent was obtained from all students and parents.

4. Findings

This section of the study presents the findings obtained in the research. The results of the study were examined based on the responses given by the students to the questions in the questionnaire and presented in tables.

The descriptive statistics related to the first question item of the study, "What is the effect of emotional and motivational factors on students' mathematics performance?", are presented in Table 1 below.

Table 1.

Descriptive Statistics of Emotional and Motivational Factors

Veriables	Mean	Sd	Skewness	Kurtosis	Min.	Max.
1. Math Anxiety	23,87	0,99	- 0,87	0,17	22.00	25,00
2. Mathematics Self-efficacy	32,22	0.97	0,45	- 0,39	31,00	34,00
3. Enjoying Mathematics	33,11	1,05	0,50	- 0,76	32,00	35,00
4. Math Performance	28,88	3,34	0,23	- 0,41	25.00	35.00

As observed in Table 1, the descriptive statistics indicate that the average mathematics anxiety score of the students is 23.87. The skewness coefficient is -0.87, indicating a negative skewness; this suggests that the number of students experiencing low levels of anxiety is greater. The mean score for mathematics self-efficacy is relatively high at 32.22. With a skewness value of 0.45, this positive skewness indicates that although some students perceive their self-efficacy as lower compared to others, the majority exhibit high self-efficacy beliefs. Students' level of satisfaction and enjoyment of mathematics is also high, with a mean of 33.11. The skewness value of 0.50 suggests that some students may have low interest in mathematics; however, the high mean indicates that most students enjoy the subject. Regarding mathematics performance, the mean score is 28.88, which reflects greater variability in performance among students. Overall, the data suggest that students generally demonstrate moderate to high levels of achievement in mathematics.

The correlation analysis results related to the second research question, "How do affective and motivational factors interact with each other in influencing students' mathematics performance?" are presented in Table 2 below.

Table 2.

Correlation Analysis Results Related to Emotional and Motivational Factors

Factors	1	2	3	4
1. Math Anxiety	_			
2. Mathematics Self-efficacy	-.643**	_		
3. Enjoying Mathematics	-.474*	.705**	_	
4. Math Performance	-.937**	.472*	.395**	_

* $p \leq .05$; **$p \leq .01$

As shown in Table 2, there are significant and directional relationships among emotional and motivational factors. A strong negative and significant correlation was found between mathematics anxiety and mathematics performance ($r = -0.937$, $p \leq .01$). This result indicates that as students' anxiety levels increase, their mathematics performance decreases markedly. Similarly, negative and significant correlations were identified between mathematics anxiety and both mathematics self-efficacy ($r = -0.643$, $p \leq .01$) and enjoyment of mathematics ($r = -0.474$, $p \leq .05$). These findings suggest that mathematics anxiety adversely affects students' perceptions of self-efficacy as well as their positive emotions towards the subject.

Conversely, there is a positive and significant relationship between mathematics self-efficacy and enjoyment of mathematics ($r = 0.705$, $p \leq .01$), indicating that students who perceive themselves as competent tend to enjoy mathematics more. Additionally, positive and significant correlations were observed between self-efficacy and mathematics performance ($r = 0.472$, $p \leq .05$) and between enjoyment of mathematics and performance ($r = 0.395$, $p \leq .01$). These results demonstrate that self-efficacy and positive emotions play a supportive role in students' academic achievement.

Accordingly, emotional (anxiety) and motivational (self-efficacy and enjoyment) factors can be considered important predictors of mathematics performance. The findings highlight the importance of implementing interventions aimed at reducing students' anxiety levels and enhancing their self-efficacy beliefs within learning environments.

5. Discussion, Conclusion, and Recommendations

This section presents a discussion based on the research questions and relevant literature. The findings indicate that students' mathematics performance is positively correlated with their mathematics self-efficacy levels and enjoyment of mathematics, while negatively correlated with mathematics anxiety. These results align with previous studies emphasizing the decisive role of affective factors on students' academic achievement (Zivković et al., 2023; Ramirez et al., 2018). Zivković et al. (2023) reported that mathematics performance is negatively associated with anxiety levels but positively associated with enjoyment and self-efficacy beliefs. Their study further revealed that mathematics anxiety is negatively related to both self-efficacy and enjoyment, whereas a positive relationship exists between enjoyment and self-efficacy.

The detrimental effect of anxiety on performance has been extensively examined in the literature. Dowker et al. (2016) demonstrated that high mathematics anxiety limits students' cognitive resources during problem-solving, thereby negatively affecting achievement. Similarly, Maloney and Beilock (2019) noted that mathematics anxiety developed in early childhood shapes long-term learning attitudes. Gunderson et al. (2018) emphasized that lower mathematics achievement may predict higher anxiety levels, which in turn could adversely affect future learning processes. Ashcraft and Kirk (2001) suggested that anxiety depletes cognitive resources, impairing problem-solving and concentration. Barroso et al. (2020) found that elevated anxiety levels reduce both students' self-efficacy beliefs and positive attitudes toward mathematics. Du et al. (2021) and Forsblom et al. (2022) highlighted that feelings of inadequacy in mathematics increase anxiety, negatively influencing the learning process. Passolunghi et al. (2019) proposed that mathematics anxiety in primary school students directly impairs achievement. Espino et al. (2017) established a significant link between high mathematics anxiety, low achievement, early beliefs about mathematical ability, and avoidance of future mathematics educational opportunities.

Enjoyment of mathematics also emerges as a significant determinant of performance. Areepattamannil (2014) reported that students who enjoy mathematics tend to have higher academic achievement, especially at the primary school level. A cross-cultural study conducted by Raccanello et al. (2018) in Italy, Germany, and the USA confirmed the contribution of enjoyment to the learning process. Forsblom et al. (2021) found that students confident in solving mathematical problems derive more enjoyment and experience less anxiety. They also stated that enjoyment positively influences achievement, whereas negative emotions such as anger and distress have a detrimental effect. However, while Zivković et al. (2023) identified a significant

positive correlation between enjoyment and achievement, they also emphasized that enjoyment alone is not a strong direct predictor of performance.

Mathematics self-efficacy is considered one of the most influential affective factors on students' achievement. Rozgonjuk et al. (2020) reported that self-efficacy effectively reduces mathematics-related anxiety. Schunk and DiBenedetto (2019) noted that students with high self-efficacy are more willing to undertake tasks, less fearful of errors, and more motivated to achieve success. Zivković et al. (2023) demonstrated that the impact of self-efficacy on achievement is stronger and more significant among fifth-grade students. Du et al. (2021) and Lee et al. (2022) indicated that persistent low achievement reduces self-efficacy levels, which may lead to negative attitudes toward mathematics and school in general. Zakariya (2021) suggested that mathematics self-efficacy is a stronger predictor of achievement than enjoyment. Li et al. (2021) emphasized that self-efficacy is a critical mediator between cognitive activation and mathematics achievement.

Collectively, these findings suggest that students who develop positive attitudes toward mathematics tend to achieve higher academically, whereas high anxiety levels negatively impact achievement. Accordingly, it is recommended to develop intervention programs aimed at strengthening students' self-efficacy and adopting strategies to reduce mathematics anxiety. Supporting self-efficacy, positive attitudes, and low anxiety levels, especially at the primary school level, can serve as effective areas of intervention to enhance mathematics achievement. Therefore, it is crucial to structure curricula not only by considering cognitive factors but also by integrating affective components.

An additional significant finding of the study clearly demonstrates the impact of affective and motivational factors on students' mathematics performance. In particular, the strong negative correlation between mathematics anxiety and performance indicates that anxiety acts as a suppressive factor on achievement. This result is consistent with the study conducted by Zivković et al. (2023), which reported that mathematics anxiety is negatively associated with achievement but positively correlated with enjoyment of mathematics and mathematics self-efficacy. Moreover, mathematics anxiety was found to have a negative relationship with both enjoyment and self-efficacy, whereas a significant positive correlation exists between enjoyment and self-efficacy (Zivković et al., 2023).

When interpreted within the framework of Bandura's (1982) social cognitive theory, these findings suggest that individuals' self-efficacy beliefs influence not only their academic success but also their attitudes toward learning. Individuals with high self-efficacy tend to develop greater motivation, which positively affects learning processes. Indeed, this study revealed that students with higher self-efficacy exhibited more positive attitudes toward mathematics and demonstrated higher academic achievement. This aligns with Pekrun's (2006) and Pekrun et al.'s (2007, 2017) assertions that emotional experiences are not merely momentary reactions but powerful determinants shaping students' motivational processes.

Supporting literature corroborates these outcomes. Herges et al. (2017) reported a moderate positive relationship between students' enjoyment of mathematics and their perceived academic success. Tabuk (2019) identified a significant moderate correlation between mathematics self-efficacy and achievement, emphasizing self-efficacy as one of the strongest predictors of mathematics success. Similarly, Yıldırım (2011) documented consistent positive associations between mathematics self-efficacy and achievement. Alpaslan and Ulubey (2019) found that

students' academic achievement positively correlates with positive achievement emotions but negatively correlates with negative emotions and self-regulated learning strategies. Additionally, Yenilmez and Özabacı (2003) observed a significant negative relationship between students' mathematics anxiety and academic achievement, noting that as achievement increases, anxiety levels decrease.

Collectively, these findings demonstrate that students' emotional experiences and motivational states related to mathematics not only influence their achievement but also directly affect their attitudes toward the subject. Therefore, educational practices should address not only cognitive competencies but also affective and motivational factors, which play a critical role in enhancing mathematics achievement.

6. Conclusion

The study's findings reveal that students' affective and motivational conditions exert a decisive influence on their academic success. Specifically, mathematics anxiety negatively affects students' performance, self-efficacy beliefs, and enjoyment of mathematics; as anxiety increases, both achievement levels and positive emotions decrease. Conversely, positive and significant relationships between mathematics self-efficacy, enjoyment, and performance indicate that students' confidence in themselves and their positive attitudes support academic achievement.

Positive emotional experiences and high motivation levels enable students to engage more effectively in learning processes, thereby enhancing their success; conversely, negative emotions and low motivation adversely affect achievement. These results indicate that mathematics achievement is closely related not only to cognitive competencies but also to affective and motivational factors. Accordingly, educational practices should adopt holistic approaches that focus not only on increasing students' academic knowledge but also on reducing anxiety, enhancing self-efficacy, and strengthening positive attitudes toward the subject. Such approaches are expected to sustainably improve students' academic and affective development, thereby supporting ongoing achievement.

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