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A Survey of Mathematics Anxiety and Self-Efficacy among Elementary Students

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Abstract

Although mathematics anxiety and self-efficacy have received substantial attention in mathematics education, survey-based evidence on elementary students' affective readiness in numeracy learning remains limited. This study aims to describe the levels of mathematics anxiety and mathematics self-efficacy among elementary school students and examine the relationship between the two variables. A quantitative approach with a descriptive correlational survey design was employed, involving 150 fifth-grade students selected through proportionate random sampling. Data were collected using mathematics anxiety and mathematics self-efficacy questionnaires, both validated through expert judgment and internal consistency testing. The data were analyzed using descriptive statistics and Spearman correlation analysis. The findings indicate that students' mathematics anxiety was generally at a moderate level, while their mathematics self-efficacy was also categorized as moderate. The correlation analysis revealed a significant negative relationship between mathematics anxiety and mathematics self-efficacy, indicating that students with higher anxiety tended to report lower confidence in learning mathematics. This study contributes to elementary mathematics education by emphasizing the importance of affective factors in strengthening students' numeracy readiness. The practical implication is that teachers need to create

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supportive, low-pressure, and confidence-building mathematics learning environments that normalize errors, strengthen mastery experiences, and encourage students to engage more positively with mathematical tasks.

Keywords: Mathematics Anxiety; Mathematics Self-Efficacy; Elementary Students; Numeracy Learning; Correlational Survey.

INTRODUCTION

Mathematics is a foundational subject in elementary education because it supports logical reasoning, problem solving, quantitative literacy, and the development of numeracy competence. At the elementary level, mathematics learning is expected to help students understand numerical relationships, interpret everyday quantitative situations, and apply mathematical ideas in meaningful ways. However, mathematics is still frequently perceived by students as a difficult, rigid, and intimidating subject. This perception shows that mathematics learning is not determined solely by cognitive readiness, but also by affective factors that shape students' willingness to participate and persist in learning.

One affective factor that receives increasing attention in mathematics education is mathematics anxiety. Mathematics anxiety refers to feelings of tension, worry, fear, or discomfort that emerge when students face mathematical tasks, classroom questions, tests, or problem-solving situations. Students with mathematics anxiety may understand part of the lesson, but their emotional discomfort can reduce their concentration, disrupt working memory, and encourage avoidance behavior. Classical and contemporary studies consistently describe mathematics anxiety as a barrier that can weaken performance and reduce students' willingness to engage with mathematics (Ashcraft, 2002; Barroso et al., 2021; Dowker et al., 2016).

In elementary classrooms, mathematics anxiety is especially important because students are still building their early academic identity. Negative experiences at this level may develop into long-term beliefs that mathematics is only for certain students. If students repeatedly feel embarrassed when giving wrong answers, pressured by test situations, or confused by word problems, they may begin to avoid mathematical tasks. This early avoidance can reduce opportunities for practice and, over time, weaken numeracy development. Therefore, mathematics anxiety should be treated as a learning issue rather than as a minor emotional response.

Another essential affective factor is mathematics self-efficacy. Self-efficacy refers to students' belief in their capability to organize and carry out actions needed to complete specific tasks successfully (Bandura, 1997). In mathematics learning, self-efficacy describes how strongly students believe that they can understand explanations, solve problems, correct errors, and complete tasks despite difficulty. Students with stronger mathematics self-efficacy are more likely to persist, use alternative strategies, ask questions, and interpret mistakes as part of the learning process rather than as proof of inability.

Research on self-efficacy has shown that students' beliefs about their capability influence their academic behavior and achievement. Pajares and Miller (1994) found that mathematics self-efficacy was strongly related to mathematical problem solving. More recent motivation research also confirms that self-efficacy contributes to persistence, engagement, and adaptive learning behavior (Schunk & DiBenedetto, 2020; Usher & Pajares, 2009). In this sense, mathematics self-efficacy can function as a psychological resource that helps students remain involved in learning even when mathematical tasks become challenging.

The relationship between mathematics anxiety and self-efficacy is theoretically important. Anxiety may reduce confidence because students who feel threatened by mathematical tasks tend to doubt their ability. Conversely, stronger self-efficacy may reduce anxiety because students perceive mathematical problems as manageable rather than threatening. This reciprocal logic implies that both constructs should be examined together. A student who has moderate mathematical ability may still struggle if anxiety is high and self-efficacy is weak; similarly, a student with strong confidence may persist even when encountering difficulty.

Previous studies have examined mathematics anxiety, self-efficacy, and achievement across different educational levels. Meta-analytic evidence indicates a negative association between mathematics anxiety and mathematics achievement (Barroso et al., 2021; Namkung et al., 2019). Other studies have emphasized that self-efficacy is connected to problem solving, engagement, and academic motivation (Pajares & Miller, 1994; Schunk & DiBenedetto, 2020). However, many studies focus on secondary or higher education contexts, while elementary-level survey studies that simultaneously map mathematics anxiety and self-efficacy remain relatively limited.

The research gap addressed in this study lies in the need for an empirical profile of elementary students' affective conditions in mathematics learning. Instructional improvement is often directed toward teaching methods, learning media, and assessment formats, yet teachers also need information about students' anxiety and confidence. A descriptive survey can provide baseline data that helps schools identify whether students experience mathematics primarily as a manageable challenge or as a source of pressure. Such information is useful before designing interventions, enrichment activities, remedial support, or classroom management strategies.

The novelty of this study is its focus on elementary students' mathematics anxiety and self-efficacy as two interconnected affective constructs in numeracy learning. The study does not test an instructional intervention; instead, it maps students' affective profile and examines the direction and strength of the relationship between anxiety and self-efficacy. The study is grounded in Bandura's self-efficacy theory and the affective perspective of mathematics learning, which views mathematical development as a process shaped by both cognitive and emotional factors.

Based on this rationale, the study aims to describe the levels of mathematics anxiety and mathematics self-efficacy among fifth-grade elementary students and to examine the relationship between both variables. The findings are expected to contribute to mathematics education by providing evidence that affective readiness should be considered in efforts to strengthen elementary numeracy learning.

METHODS

Type of Research

This study employed a quantitative approach with a descriptive correlational survey design. The quantitative approach was used because the study collected numerical data from structured questionnaires and analyzed the data statistically. The survey design was selected because the study aimed to obtain an empirical description of students' mathematics anxiety and self-efficacy at a particular point in time. The correlational component was used to examine whether there was a relationship between the two affective variables.

The study did not manipulate instructional treatment or compare experimental groups. Instead, it focused on measuring students' perceptions and affective responses toward mathematics learning. This design is appropriate for identifying patterns within a student population and for generating baseline information that may inform classroom practice, school programs, and future intervention studies.

Research Design

The research design was a cross-sectional survey. Data were collected once through two structured instruments: a mathematics anxiety questionnaire and a mathematics self-efficacy questionnaire. Mathematics anxiety was operationalized as students' tension, worry, fear of mistakes, test-related discomfort, and nervousness when dealing with mathematical tasks. Mathematics self-efficacy was operationalized as students' confidence in understanding explanations, solving routine and non-routine problems, persisting in difficult tasks, and checking their own answers.

The design followed a descriptive-correlational sequence. First, students' scores were summarized using descriptive statistics. Second, the scores were classified into low, moderate, and high categories. Third, correlation analysis was performed to determine the direction and strength of the relationship between mathematics anxiety and mathematics self-efficacy.

Participants and Sampling Technique

The participants were 150 fifth-grade elementary school students from three public elementary schools. Fifth-grade students were selected because they had studied several numeracy topics, including whole-number operations, fractions, measurement, and word problems. These topics require not only procedural skill but also confidence and persistence when solving unfamiliar tasks.

The sampling technique used was proportionate random sampling. Each school contributed respondents proportionally according to the number of fifth-grade students enrolled. The sample consisted of 78 female students and 72 male students. Participation was voluntary, and students' identities were anonymized using respondent codes to protect confidentiality.

Instruments and Data Collection

Data were collected using two questionnaires developed from established constructs in mathematics anxiety and self-efficacy literature. The Mathematics Anxiety Questionnaire consisted of 24 statements covering anxiety during mathematics tests, fear of making mistakes, anxiety in solving word problems, nervousness when answering in class, and anxiety when doing mathematics homework. The Mathematics Self-Efficacy Questionnaire consisted of 24 statements covering confidence in understanding teacher explanations, solving routine problems, solving word problems, persisting in difficult tasks, and checking answers.

Both instruments used a four-point Likert scale ranging from strongly disagree to strongly agree. The instruments were reviewed by two mathematics education experts and one educational measurement expert. A pilot test was conducted with 35 students outside the main sample. Reliability testing using Cronbach's alpha produced a coefficient of .86 for the mathematics anxiety questionnaire and .88 for the mathematics self-efficacy questionnaire, indicating acceptable internal consistency.

Data Analysis Technique

The data were analyzed using descriptive statistics and Spearman correlation analysis. Descriptive statistics included minimum score, maximum score, mean, standard deviation, frequency, and percentage. Spearman correlation was selected because the questionnaire data were based on ordinal Likert-scale responses and the analysis focused on the direction and strength of the relationship between two variables. Statistical analysis was conducted using spreadsheet and statistical software. Ethical considerations included school permission, voluntary participation, anonymity, and the use of data only for academic purposes.

RESULTS

Profile of Respondents

This section presents the research findings based on the survey data collected from 150 fifth-grade elementary students. The findings are reported factually and systematically according to the research objectives. The presentation begins with respondent characteristics, followed by descriptive statistics of mathematics anxiety, descriptive

statistics of mathematics self-efficacy, indicator-based findings, correlation analysis, and divergent patterns found in the data.

Table 1. Respondent Characteristics

Characteristic	Number of Students	Percentage
Female students	78	52.00%
Male students	72	48.00%
School A	54	36.00%
School B	50	33.33%
School C	46	30.67%
Total	150	100.00%

Table 1 shows that the respondents were relatively balanced by gender and distributed across three schools. This distribution was considered adequate for describing the affective profile of fifth-grade students in the selected elementary school context. The number of students from each school was not identical because the sampling was proportionate to class size.

Students Mathematics Anxiety Level

The first variable analyzed was mathematics anxiety. The total mathematics anxiety score was obtained from 24 questionnaire items. Higher scores indicated stronger anxiety toward mathematics learning. The descriptive statistics are presented in Table 2.

Table 2. Descriptive Statistics of Mathematics Anxiety

Variable	N	Minimum	Maximum	Mean	SD
Mathematics Anxiety	150	37	88	62.41	9.12

The mean score of 62.41 indicates that students' mathematics anxiety was generally at a moderate level. The standard deviation of 9.12 suggests that students' anxiety levels varied, although most scores were concentrated around the middle range.

To provide a clearer picture of students' anxiety levels, the total scores were classified into three categories: low, moderate, and high. The classification is presented in Table 3.

Table 3. Distribution of Mathematics Anxiety Levels

Category	Number of Students	Percentage
Low	31	20.67%
Moderate	91	60.67%
High	28	18.66%
Total	150	100.00%

Table 3 indicates that most students were in the moderate anxiety category. A total of 91 students, or 60.67%, experienced moderate anxiety. This means that the majority of students did not show extreme anxiety, but they still reported discomfort in several mathematics learning situations. The presence of 28 students in the high anxiety category also indicates that nearly one-fifth of respondents may need more intensive affective support.

The low anxiety category consisted of 31 students, or 20.67%. Students in this category tended to report fewer feelings of nervousness during mathematics tasks. However, the proportion of students in the low category was smaller than those in the moderate category. This pattern suggests that mathematics anxiety was a relatively common experience among the respondents.

The survey data further show that mathematics anxiety was not evenly distributed across learning situations. Students tended to report stronger anxiety in situations involving evaluation, public performance, and mistakes. This pattern is clarified by the indicator-based analysis presented in Table 4.

Table 4. Mathematics Anxiety Based on Indicators

Indicator	Mean	SD	Category
Fear of making mistakes	3.28	0.68	High
Anxiety during mathematics tests	3.21	0.71	High
Nervousness when answering in class	2.96	0.78	Moderate
Anxiety in solving word problems	2.83	0.74	Moderate
Anxiety when doing homework	2.39	0.65	Moderate

Table 4 shows that fear of making mistakes obtained the highest mean score, followed by anxiety during mathematics tests. The lowest mean score was found in anxiety when doing mathematics homework. This indicates that students' anxiety was more strongly associated with classroom evaluation and social exposure than with independent practice.

Students Mathematics Self-Efficacy Level

The second variable analyzed was mathematics self-efficacy. Higher scores indicated stronger student confidence in learning and completing mathematics tasks. The descriptive statistics are presented in Table 5.

Table 5. Descriptive Statistics of Mathematics Self-Efficacy

Variable	N	Minimum	Maximum	Mean	SD
Mathematics Self-Efficacy	150	41	91	65.38	9.47

The mean score of 65.38 indicates that students' mathematics self-efficacy was generally at a moderate level. This result suggests that most students had some confidence in learning mathematics, but their confidence was not consistently strong across all mathematical tasks.

Table 6. Distribution of Mathematics Self-Efficacy Levels

Category	Number of Students	Percentage
Low	29	19.33%
Moderate	94	62.67%
High	27	18.00%
Total	150	100.00%

Table 6 shows that 94 students, or 62.67%, were in the moderate self-efficacy category. This means that most students believed they could learn mathematics under certain conditions, especially when tasks were familiar or similar to examples provided by the teacher. However, their confidence tended to decrease when they encountered unfamiliar word problems or multi-step tasks.

A total of 27 students, or 18.00%, were categorized as having high self-efficacy. These students reported stronger confidence in understanding explanations, attempting difficult tasks, and checking their own answers. Meanwhile, 29 students, or 19.33%, were categorized as having low self-efficacy. This group may require more structured support, feedback, and mastery experiences in mathematics learning.

The indicator-based analysis was conducted to identify which aspects of mathematics self-efficacy were relatively strong and which aspects remained weak. The results are shown in Table 7.

Table 7. Mathematics Self-Efficacy Based on Indicators

Indicator	Mean	SD	Category
Confidence in understanding teacher explanations	3.23	0.64	High
Confidence in solving routine problems	3.08	0.69	Moderate
Confidence in checking answers	2.94	0.70	Moderate
Persistence in difficult tasks	2.81	0.75	Moderate
Confidence in solving word problems	2.55	0.79	Moderate

Table 7 shows that the highest self-efficacy indicator was confidence in understanding teacher explanations. This suggests that many students felt capable of following mathematics lessons when the teacher provided direct instruction or examples. However, confidence decreased when students had to solve word problems independently. The lowest mean score was found in confidence in solving word problems.

This pattern indicates that students' confidence was stronger in teacher-guided situations than in independent problem-solving situations. Students may understand procedures demonstrated by the teacher, but they may feel less certain when they need to identify relevant information, choose operations, and interpret answers in contextual problems. This finding is important because word problems are central to numeracy learning and require both conceptual understanding and confidence.

The difference between confidence in understanding explanations and confidence in solving word problems also suggests that classroom participation does not automatically lead to independent mathematical self-efficacy. Students may appear attentive during explanations but still feel insecure when transferring that understanding to new tasks.

Comparison of Variable Categories

The comparison between mathematics anxiety and self-efficacy categories shows that both variables were concentrated in the moderate category. However, the emotional meaning of these categories differs. Moderate anxiety indicates the presence of pressure or worry, while moderate self-efficacy indicates partial confidence. The simultaneous presence of moderate anxiety and moderate self-efficacy suggests that students may be psychologically ambivalent toward mathematics: they believe mathematics can be learned, yet they still feel worried when required to perform mathematically.

Relationship between Mathematics Anxiety and Self-Efficacy

Spearman correlation analysis was conducted to examine the relationship between mathematics anxiety and mathematics self-efficacy. The results are presented in Table 8.

Table 8. Correlation between Mathematics Anxiety and Mathematics Self-Efficacy

Variables	N	Correlation Coefficient	Sig.	Interpretation
Mathematics anxiety and mathematics self-efficacy	150	-0.48	0.000	Moderate negative correlation

Table 8 shows a correlation coefficient of -0.48 with a significance value of 0.000. This indicates a statistically significant negative relationship between mathematics anxiety and mathematics self-efficacy. The negative direction means that students with higher mathematics anxiety tended to have lower mathematics self-efficacy. Conversely, students with stronger self-efficacy tended to report lower anxiety in mathematics learning.

The strength of the relationship was moderate. This means that mathematics anxiety and self-efficacy were related, but they did not explain each other completely. Other factors may also influence students' confidence and anxiety, such as prior achievement, teacher feedback, parental expectations, peer comparison, classroom climate, and familiarity with mathematical tasks.

The correlation result supports the descriptive pattern found in the previous tables. Students who reported fear of mistakes and test-related anxiety were often less confident in solving unfamiliar problems. This relationship is especially visible in word-problem situations, where students must read, interpret, select operations, and explain answers.

Visualization of the Main Pattern

Figure 1 presents the main relationship pattern conceptually. The finding can be summarized as a negative affective association: as mathematics anxiety increases, students' mathematics self-efficacy tends to decrease. In practical terms, this pattern suggests that reducing anxiety and strengthening confidence should be addressed together in elementary mathematics learning.

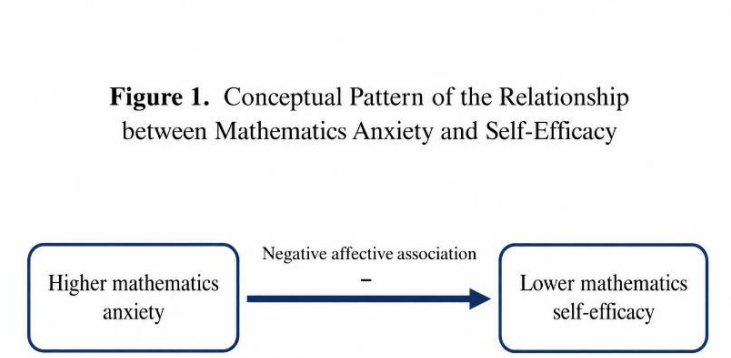


Figure 1. Conceptual Pattern of the Relationship between Mathematics Anxiety and Self-Efficacy

Although the general pattern indicated a negative relationship between mathematics anxiety and self-efficacy, several divergent profiles were found. A small group of students reported moderate anxiety but high self-efficacy. These students appeared to experience mathematics as challenging, but they still believed that they could complete mathematical tasks. This profile suggests that anxiety does not always eliminate confidence; in some cases, students may interpret anxiety as part of effort or preparation.

Another group of students reported low anxiety but also low self-efficacy. This profile suggests that the absence of anxiety does not automatically indicate strong confidence. Some students may not feel anxious because they are less emotionally involved in mathematics tasks, or because they do not perceive the tasks as personally important. Therefore, low anxiety should not always be interpreted as an optimal affective condition unless it is accompanied by adequate confidence and engagement.

The data also showed that word problems were the most sensitive context for both variables. Students who were confident in routine calculations often became less confident when problems were presented in story form. This pattern indicates that numeracy learning requires more than calculation practice. Students need repeated experiences in interpreting contexts, identifying mathematical relationships, and explaining solutions without fear of being judged negatively.

The findings from the survey provide an empirical basis for understanding students' affective readiness in mathematics learning. The results show that mathematics anxiety and self-efficacy are not marginal issues. They are present in the everyday learning experiences of elementary students and may influence how students approach mathematical tasks.

DISCUSSION

Interpretation of Mathematics Anxiety Findings

The finding that students' mathematics anxiety was generally at a moderate level indicates that anxiety is a common affective condition in elementary mathematics classrooms. Students did not necessarily experience severe anxiety, but many reported worry, nervousness, or fear in specific learning situations. The highest anxiety was associated with fear of making mistakes and mathematics tests. This pattern suggests that students' anxiety is closely connected to evaluation, classroom exposure, and the possibility of giving incorrect answers.

This finding is consistent with previous research showing that mathematics anxiety can emerge in situations where students feel pressured to perform accurately and quickly. Ashcraft (2002) explained that mathematics anxiety may consume working memory resources needed for mathematical processing. Barroso et al. (2021) also found that mathematics anxiety is negatively associated with mathematics achievement. The present study extends this discussion to the elementary context by showing that anxiety is already visible among fifth-grade students.

The stronger anxiety related to mistakes indicates that classroom culture matters. If mistakes are treated as failure or embarrassment, students may become less willing to participate. In contrast, if mistakes are treated as part of reasoning and learning, students may feel safer to express ideas. Therefore, reducing mathematics anxiety requires not only individual support but also changes in classroom interaction patterns.

Interpretation of Mathematics Self-Efficacy Findings

The finding that students' mathematics self-efficacy was also at a moderate level suggests that students possessed partial confidence in mathematics learning. They generally believed that they could understand teacher explanations and solve routine problems, but their confidence weakened when tasks became less familiar. This result supports Bandura's (1997) argument that self-efficacy is task-specific. Students may feel confident in one type of mathematical activity but uncertain in another.

The highest self-efficacy indicator was confidence in understanding teacher explanations. This suggests that teacher-guided learning still provides psychological security

for students. However, the lowest indicator was confidence in solving word problems. This difference shows that students' confidence may depend heavily on the level of scaffolding. When the teacher demonstrates the procedure, students feel more capable; when they must interpret a problem independently, their confidence declines.

This finding is aligned with studies emphasizing the role of self-efficacy in mathematical problem solving. Pajares and Miller (1994) showed that self-efficacy beliefs were related to mathematical problem-solving performance. Usher and Pajares (2009) also emphasized that mastery experiences are important sources of self-efficacy. In the present study, the moderate level of self-efficacy implies that students need more successful experiences in solving varied mathematical tasks, especially contextual and non-routine problems.

The results further suggest that self-efficacy should not be strengthened through motivational statements alone. Students need structured opportunities to experience success, receive specific feedback, compare strategies, and revise errors. Confidence grows when students repeatedly encounter tasks that are challenging but achievable.

Relationship between Anxiety and Self-Efficacy

The significant negative correlation between mathematics anxiety and mathematics self-efficacy indicates that the two constructs are meaningfully connected. Students who felt more anxious tended to report lower confidence in their ability to learn mathematics. This finding is theoretically coherent because anxiety may reduce students' sense of control, while self-efficacy depends on the belief that one can manage and complete a task successfully.

The moderate strength of the correlation also shows that mathematics anxiety and self-efficacy are related but not identical. A student may feel anxious but still believe that they can succeed, while another student may feel calm but lack confidence. This explains why the study found divergent profiles. Such profiles are important because they prevent oversimplified interpretations of students' affective conditions. Teachers should not assume that quiet students are confident, nor should they assume that anxious students are incapable.

The finding is consistent with studies showing that anxiety, confidence, and achievement interact in complex ways. Namkung et al. (2019) reported a negative relation between mathematics anxiety and mathematics performance among school-aged students. Schunk and DiBenedetto (2020) emphasized that self-efficacy influences students' motivation and persistence. In the present study, the negative relationship suggests that mathematics learning support should target both emotional comfort and competence beliefs.

In classroom practice, teachers may reduce anxiety by using supportive feedback, allowing students to explain errors, and avoiding excessive speed pressure. At the same time, teachers may strengthen self-efficacy through mastery experiences, graduated task difficulty, peer discussion, and reflection on successful strategies.

Implications of the Study

Theoretically, this study reinforces the view that mathematics learning is shaped by both cognitive and affective dimensions. Numeracy development cannot be fully understood through achievement scores alone. Students' beliefs, emotions, and perceptions influence how they approach mathematical tasks. By mapping mathematics anxiety and self-efficacy simultaneously, the study provides a more complete picture of students' affective readiness in elementary mathematics learning.

Practically, the findings imply that teachers should design learning environments that reduce fear and build confidence. Teachers can normalize mistakes as part of mathematical reasoning, provide enough wait time, use collaborative problem solving, and encourage students to explain their thinking without fear of ridicule. Assessment should also be used formatively so that students receive feedback that helps them improve rather than only signals failure.

The findings also have implications for school-level numeracy programs. Schools may include affective screening in mathematics learning evaluation, especially for upper elementary students. Simple surveys can help teachers identify students who need confidence-building support or anxiety-reduction strategies. Such data can complement cognitive assessments and provide a more balanced basis for intervention.

Limitations and Future Research

This study has several limitations. First, the data were collected through self-report questionnaires, so the results may be influenced by students' interpretation of statements and their willingness to report feelings honestly. Second, the cross-sectional design does not allow causal conclusions. The study can identify a relationship between anxiety and self-efficacy, but it cannot determine whether anxiety reduces self-efficacy or whether weak self-efficacy increases anxiety.

Third, the study was conducted in a limited school context, which may affect the generalizability of the findings. Future research should involve broader samples from different regions and school types. Longitudinal studies are also recommended to examine how mathematics anxiety and self-efficacy develop over time. Mixed-methods studies combining surveys, interviews, classroom observations, and achievement data may provide deeper insight into the affective dynamics of elementary mathematics learning.

CONCLUSION

This study examined mathematics anxiety and mathematics self-efficacy among elementary school students using a descriptive correlational survey design. The findings show that students' mathematics anxiety was generally at a moderate level, with the strongest anxiety appearing in fear of making mistakes and mathematics test situations. Students' mathematics self-efficacy was also at a moderate level, with stronger confidence in understanding teacher explanations and weaker confidence in solving word problems independently.

The correlation analysis revealed a significant moderate negative relationship between mathematics anxiety and mathematics self-efficacy. This means that students with higher mathematics anxiety tended to report lower confidence in mathematics learning. The findings confirm that affective factors are important in elementary mathematics education and should be considered alongside cognitive achievement and instructional quality.

The contribution of this study lies in providing a survey-based affective profile of elementary students in mathematics learning. The results suggest that teachers need to create learning environments that reduce fear, tolerate mistakes, strengthen mastery

experiences, and support students' confidence in solving mathematical problems. Future research is recommended to expand the sample, apply longitudinal designs, and integrate achievement data to obtain a more comprehensive understanding of how anxiety and self-efficacy influence mathematics learning.

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