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Math Anxiety in Elementary School Students: A Phenomenological Study of Learning Experiences in The Classroom

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ABSTRACT

Purpose – This study phenomenologically examines the forms, sources, and dynamics of mathematics anxiety among students at SDN 1 Kedungrejo, Probolinggo Regency. At the elementary level, mathematics anxiety is critical, as it can hinder learning and slow students' numeracy skill development.

Methodology – The study uses a descriptive qualitative approach and a phenomenological case study design. Data came from classroom observations, interviews, and triangulation with the principal, mathematics teacher, and five students with varying anxiety levels. Analysis followed the Miles, Huberman, and Saldaña model: data reduction, narrative presentation, and drawing conclusions.

Findings – The results show: (1) mathematics anxiety is an affective and socio-pedagogical construct shaped by classroom interactions and teaching patterns; (2) the anxiety stems not just from students' internal conditions, but also school structures, learning culture, and curriculum pressure; and (3) it arises from complex interplay among cognitive, emotional, and social factors in students' daily learning.

Contribution – These results show that mathematics anxiety in elementary students is multidimensional. It calls for a more humanistic, emotionally supportive approach to teaching to strengthen students' self-efficacy.

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INTRODUCTION

Mastery of mathematics is an essential competency in basic education and an indicator of students' readiness to face the dynamics of technology and the challenges of the 21st century (Pare & Sihotang, 2023). However, international evaluation results, such as PISA and the National Assessment report, indicate that Indonesian students' numeracy skills remain low, confirming fundamental problems in the mathematics learning process in elementary schools (Wijaya et al., 2024). Among the various determinants that influence

this performance, math anxiety is the most common affective factor, characterized by fear, tension, or rejection when individuals interact with math tasks.

The phenomenon of math anxiety is increasingly prominent in primary education, when students are in the early stages of forming perceptions, self-confidence, and attitudes toward learning mathematics. This situation is also evident at SDN 1 Kedungrejo in Probolinggo Regency, where some students exhibit negative affective responses during learning, such as discomfort, confusion, and low engagement. A deep understanding of the dynamics of math anxiety, grounded in students' subjective experiences, is important for providing an empirical basis for developing learning strategies that are more empathetic and responsive to their emotional needs.

Although the government has mainstreamed strengthening numeracy competencies across various curriculum policies, learning practices in elementary schools indicate a gap between academic achievement requirements and students' affective readiness (Mugara & Ali, 2025). In many classrooms, including at SDN 1 Kedungrejo, the approach to mathematics learning still focuses on problem-solving and cognitive targets, thereby neglecting students' emotional dimensions. As a result, some students experience stress, tension, and fear that trigger math anxiety, a condition that can hinder conceptual understanding and active participation in class (Klee et al., 2022). Teachers are often unaware that pedagogical interactions, communication patterns, and previous learning experiences also contribute to the emergence of this anxiety.

Understanding mathematical anxiety among elementary school students requires an examination through a comprehensive theoretical framework that encompasses cognitive, affective, and learning experience aspects. The Cognitive-Affective Learning Perspective emphasizes that learning results from the interaction between students' cognitive capacities and their emotional responses (Schneider et al., 2022). Negative emotions, particularly anxiety, have been shown to inhibit memory function, interfere with problem-solving abilities, and reduce the effectiveness of mathematics learning from an early stage of development. Thus, math anxiety cannot be viewed as a standalone emotional symptom; rather, it is closely related to the cognitive mechanisms involved in mathematical activities.

Self-efficacy theory provides a more specific perspective on how students' self-beliefs influence the emergence of math anxiety (del Carmen Pérez-Fuentes et al., 2020). Students with low self-efficacy tend to view math tasks as burdens or threats, making them more prone to fear, avoidance, and emotional distress when faced with numerical problems. In addition, the Mathematics Anxiety Theory explains the relationship between learning experiences, perceptions of teachers, performance demands, and psychological mechanisms that trigger negative affective responses to mathematics (Zuo et al., 2024). On the other hand, the Constructivist approach emphasizes that meaningful learning is constructed through active knowledge construction, social interaction, and appropriate pedagogical support from teachers (Hsbollah & Hassan, 2022). This approach provides a basis for designing learning interventions that can minimize anxiety and optimize students' mathematical understanding.

Mathematics anxiety in students can be understood as a consequence of unsupportive learning experiences, such as tense classroom interactions, overly procedural learning approaches, and a lack of emotional support from the learning environment. The constructivist perspective aligns with the phenomenological approach used in this study, as both emphasize the importance of understanding how students construct meaning from their learning experiences (Burns et al., 2022). The integration of these three theoretical approaches provides a strong conceptual foundation for examining students' subjective experiences of math anxiety in the classroom.

A literature review shows that the issue of math anxiety among elementary school students has been widely researched, but there remain limitations in methodological scope and research context. The study (Tsaqila et al., 2023), for example, reveals that the majority of elementary school students experience moderate to high levels of math anxiety, triggered by somatic, cognitive, and affective aspects, as well as low conceptual mastery. Another study (Sulisawati & Rohman, 2025) uses a qualitative descriptive approach with

questionnaires and short interviews as instruments, thus only superficially describing the phenomenon and not delving deeply into students' subjective experiences in dealing with this anxiety.

In addition, no research has specifically examined math anxiety in the context of rural elementary schools, particularly at SDN 1 Kedungrejo in Probolinggo Regency, which has distinct social, economic, and pedagogical characteristics compared to urban schools. Rural environments generally face specific challenges, such as limited learning resources, the dominance of traditional learning methods, and the intensity of teacher-student interaction, which greatly influences the learning experience (Li et al., 2024). Unlike previous descriptive-survey studies, this study seeks to explore students' authentic experiences in the mathematics learning process. The phenomenological approach was chosen because it provides a deeper understanding of the dynamics of emotions, self-perception, relationships with teachers, and the meanings students construct in their interactions with mathematics.

This study offers a new contribution to the study of mathematics anxiety among elementary school students through a phenomenological exploration, enabling an in-depth investigation of students' subjective experiences during classroom mathematics learning. Unlike previous studies that focused on measuring anxiety levels or identifying causal factors through a descriptive approach, this study examines how anxiety arises, is experienced, interpreted, and managed by students in the context of real learning. The novelty of this research lies in its focus on an elementary school in a rural area, namely SDN 1 Kedungrejo in Probolinggo Regency, which has different social and pedagogical characteristics from the urban schools that dominate the previous literature.

Given the complexity of math anxiety in the context of elementary school learning, it is necessary to formulate a problem that guides research in a more focused, structured manner. This study is designed to answer three key questions: what are the dynamics and triggering factors of math anxiety in students, how do students experience the process of learning mathematics in the classroom, and how do they respond to and manage this anxiety in actual learning situations. This problem formulation not only serves as a conceptual guide but also as a basis for phenomenological analysis aimed at comprehensively understanding students' emotional experiences (Hidayatullah, 2024).

In line with this formulation, this study aims to examine in depth the subjective experiences of elementary school students in mathematics learning, particularly regarding the emergence of mathematics anxiety. Through a phenomenological approach, this study describes the forms and characteristics of anxiety experienced by students, examines the internal and external factors that influence it, and analyzes the dynamics of pedagogical interactions that shape students' affective experiences (Sudarto et al., 2025). The research findings are expected to provide empirical and conceptual contributions to the development of more inclusive, empathetic, and emotionally supportive mathematics learning strategies for students.

METHODOLOGY

Research design

This study uses a descriptive qualitative approach (Turale, 2020) with a phenomenological case study design (Hadi, 2021) to examine students' subjective experiences of mathematics anxiety in the context of learning at SDN 1 Kedungrejo, Probolinggo Regency. The phenomenological design was chosen because it allows for an in-depth exploration of the structure of students' internal experiences, including the emotional dynamics and pedagogical interactions that shape anxiety responses during the mathematics learning process.

Data Collection

Data collection was conducted on November 25 through direct observation, in-depth interviews, and searches of learning documentation. Observation was carried out systematically by focusing on three main dimensions that represent the manifestation of anxiety experiences in the context of the classroom. First, in the behavioral indicators dimension, researchers observed students' facial expressions when the teacher explained the material or gave questions, including signs of tension, confusion, or fear that appeared spontaneously.

Second, on the affective dimension, observation is directed to capture the emotional dynamics of students during the process of mathematics Learning. The researcher observed students' emotional reactions when presented with questions, noting expressions of anxiety, frustration, panic, and self-confidence. Third, in the interactional and pedagogical dimensions, observation is focused on the communication pattern between teachers and students, whether it is authoritarian, supportive, or dialogical, and how these communication styles contribute to the construction of a sense of security or even strengthen anxiety.

The documents analyzed include Learning Implementation Plans (RPPs) and mathematics teaching modules to identify the pedagogical designs, methodological approaches, and evaluative orientations used by teachers in teaching and learning. Student Worksheets (LKS) are used to understand the complexity of tasks, instructional patterns, and forms of exercise that may trigger cognitive and affective stress in students. In addition, the results of daily and math tests were analyzed to assess the consistency of students' academic performance and the possible correlation between grade achievement and the anxiety narrative expressed in the interview.

Participant

The participants consisted of Principal Retno Dwi Purwatiningsih and Mathematics Teacher Siti Fatimah. Participants were selected through purposive sampling based on the relevance of their experience, the intensity of their involvement in mathematics learning, and their capacity to articulate their learning experiences verbally. Principals are chosen because they have structural authority and a comprehensive understanding of academic policy, school culture, and institutional support for mathematics learning. Mathematics teachers are selected based on their role as the main pedagogical actors who directly interact with students in the learning process, thereby providing contextual knowledge of classroom dynamics and student characteristics.

Six students, Ischak Amiruddin, Rendi Ali Arifin, Rani Eka Yulianti, Elsa Ainurrohman, and Rully Auliya Zora, acted as the main informants. Student involvement was prioritized to capture the range of emotional experiences, self-perceptions, and forms of anxiety that emerged during teaching and learning interactions. The selection of students includes: (1) being registered as an active participant in the observed math class; (2) show an indication of mathematical anxiety based on the results of initial observation and the teacher's recommendations, such as symptoms of avoidance, emotional tension, or decreased academic performance; (3) have adequate communication skills to reflect on their learning experiences; and (4) obtaining consent from parents/guardians to participate in the research.

Data Analysis

Research data was collected through in-depth interviews, classroom observations, and document reviews. The data collection procedure followed the iterative inquiry principles outlined by Chand (2025) to ensure the information obtained was comprehensive and in-depth. The analysis used the Miles, Huberman, and Saldana model, which includes three main stages: data reduction to identify relevant information; data presentation in a structured narrative; and drawing and verifying conclusions through repeated cross-checking across sources.

The validity of the data is reinforced through source triangulation, by comparing the findings from the principal, mathematics teacher, and five students as key informants. This triangulation technique is used to test the consistency of the data and increase the credibility of phenomenological interpretations in the context of mathematics learning in elementary schools (Handoko et al., 2024).

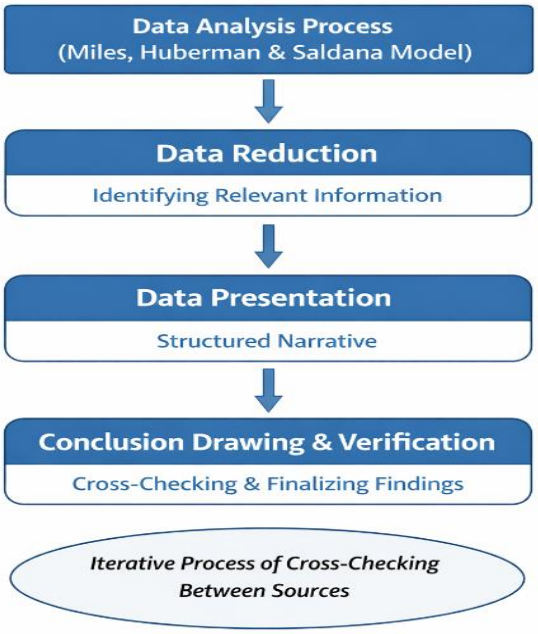

Figure 1. Data Analyst Process Flowchart

FINDINGS

The Dynamics of Math Anxiety in Classroom Learning

Class observations indicate that math anxiety arises from the interplay among students' physiological responses, behavior, and emotions during learning. Symptoms of anxiety appear to intensify when students are faced with demands for quick responses or more complex problem-solving tasks. Some students appear to avoid eye contact with the teacher, make small motor movements such as shaking their legs or playing with writing instruments, and bow their heads when asked to answer questions. These patterns of nonverbal expression reflect the psychological pressure students experience, especially when interacting with challenging material, such as fractions and mixed operations.

Figure 1. Identification of Student Anxiety in Learning Mathematics

This anxiety phenomenon does not only appear during evaluations, but also during the delivery of material. When the teacher moved on to speed calculation exercises, some students showed increased tension, as evidenced by slow responses, hesitant expressions, and a tendency to compare answers with their friends in an attempt to seek certainty (Siregar, 2025). In such situations, the classroom atmosphere turned into a space

that stimulated competition, which for some students actually intensified academic pressure and exacerbated their anxiety.

Figure 2. Analysis and Problem Solving

Confirmation from the math teacher, Siti Fatimah, reinforces the findings of the above observation. She stated that the decline in student participation generally occurs at the stage of learning that requires analysis and problem-solving. According to her:

> "*Students who have a low perception of their mathematical abilities often stop the thinking process before they even begin, and choose to remain silent even before trying to read the question. This pattern indicates the existence of avoidance behavior mechanisms that arise due to fear of failure.*"

These findings show that math anxiety not only serves as an affective response but also shapes how students process information, make decisions, and interact during learning. Emotional unpreparedness, reflected in avoidance behavior, prevents students from entering higher cognitive stages in understanding mathematical concepts (Saputra, 2024). Thus, the dynamics of anxiety in the classroom reflect the reciprocal relationship among learning experiences, perceptions of self-efficacy, and the pedagogical strategies teachers apply.

Table 1. Types of Documents, Extracted Information, and Trustworthiness Criteria

Document Type	Information Extracted	Validity Function	Reliability Strategy
Lesson Plan (RPP) / Teaching Module	Instructional design, assessment orientation, learning objectives	Content validation of pedagogical alignment	Systematic coding and document comparison
Student Worksheets (LKS)	Task structure, cognitive demand, instruction clarity	Verification of task-related anxiety triggers	Cross-document consistency check
Daily Tests and Mathematics Exams	Achievement patterns, performance fluctuation	Triangulation with interview data	Archival record comparison
Teacher Assessment Notes	Evaluative language, feedback patterns	Construct validation of academic self-perception	Inter-source cross-checking
Report Cards (Mathematics Section)	Longitudinal academic performance	Pattern confirmation over time	Temporal consistency analysis
Teacher Reflective Notes	Pedagogical awareness of student difficulties	Contextual corroboration	Analytical memoing and audit trail
Classroom Photographs	Learning environment and interactional context	Contextual validation	Visual-data triangulation

The results of document analysis are systematically carried out through a content analysis procedure, with emphasis on content consistency, coherence between documents, and their compatibility with data from observations and interviews at SDN 1 Kedungrejo, Probolinggo Regency. The results of the information from the observations from the document analysis are in Table 1.

The types of documents analyzed include Learning Implementation Plans (RPPs) or mathematics teaching modules, Student Worksheets (LKS), daily test results, mathematics test results, teacher assessment notes, mathematics report books, teacher reflection notes (if available), and photos of the learning situation as contextual data. From the Learning Implementation Plans and mathematics teaching modules, this study identifies pedagogical orientation, evaluation approaches, and learning structures designed by teachers. The Student Worksheets and test instruments were analyzed to assess the cognitive complexity of the questions, instructional patterns, and potential cognitive loads that could trigger anxiety.

Exam results, assessment notes, and report cards are used to track students' academic performance history and to detect fluctuations or declines in achievement that may correlate with the anxiety students report in interviews. Meanwhile, evaluative language in teachers' records is analyzed to understand how institutional narrative constructions can affect students' academic self-perception. Overall, these results indicate that math anxiety is an affective and socio-pedagogical construct influenced by classroom interactions and learning design. The consistency of student responses in various situations indicates that this anxiety is systemic rather than incidental, requiring a more comprehensive approach to addressing it.

The Principal's Perspective on the Learning Environment

In this context, the results of an interview with the principal of SDN 1 Kedungrejo, Retno Dwi Purwatiningsih, provided a strategic perspective on the factors that trigger math anxiety in the school environment. Retno explained that:

> "*Symptoms of anxiety do not only appear in higher grades, but have been seen since the early grades, when students begin to deal with basic mathematical operations. She emphasized that this anxiety generally stems from a series of negative learning experiences, such as failing to answer questions in front of the class or repeatedly receiving low grades.*" *The accumulation of these experiences shapes the perception that mathematics is a frightening subject and triggers emotional stress in students.*

Retno also highlighted:

> *"The role of an achievement-oriented evaluation culture in reinforcing this perception. The pressure to achieve minimum standards and the dominant use of test-based assessment are considered to increase students' psychological burden. According to him, evaluation models that demand high accuracy make students feel that they have no room for error or gradual learning, causing anxiety to arise even before the learning process begins.*"

Retno also emphasizeRetno emphasized the pedagogical and institutional dimensions that contribute to math anxiety in schools. She explained that teachers are often caught up in a dense curriculum. As a result, the learning process moves quickly and focuses more on delivering material than on student understanding. This situation limits more humanistic learning, such as reflective dialogue, learning pace adjustments, and providing emotional support when students face problem-solving tasks xpands on the observation by showing that math anxiety is not only influenced by internal factors within students, as Trirezeki et al. (2025) found, but also by interactions among school structure, learning culture, and curriculum pressure. Thus, math anxiety at SDN 1 Kedungrejo cannot be understood as a purely affective response, but rather as a socio-pedagogical construct influenced by institutional policies and daily teaching practices. These findings emphasize the need for more adaptive pedagogical reforms that are oriented towards students' emotional well-being in mathematics learning.

The Phenomenological Experience of Students at SDN 1 Kedungrejo

Interviews with five students revealed variations in the forms of math anxiety, although all of them exhibited relatively similar emotional patterns. A summary of the findings is presented in Table 1, which

includes the forms of anxiety, key statements, behavioral indicators, and psychological meanings interpreted through a phenomenological approach.

Table 2. Core Findings of the Phenomenological Experience of Students Related to Math Anxiety

Participants	Form of Anxiety	Key Statements	Behavioral Indicators	Psychological Meaning
Ishak Amiruddin	Fear of making mistakes	Fear of being scolded for making a mistake.	Hesitation to raise hands	Anxiety stemming from residual fear
Rendi Ali Arifin	Difficulty understanding the instructions	Don't understand the meaning yet, but am already being told to hurry up.	Spending too much time on contextual questions	Anxiety arises from cognitive overload
Rani Eka Yulianti	Social anxiety	Embarrassed if laughed at by friends.	Deleting repeated answers	Anxiety related to academic self-image
Elsa Ainurrohman	Pressure to calculate quickly	My friends are all fast, I'm the slowest.	Finishing tasks last	Experiencing performance pressure
Rully Auliya Zora	Emotional instability when facing difficulties	If I can't do it right away, I get dizzy.	Closing the book. Leaning my body closer to the table	Showing task avoidance responses

The results of the analysis show that student anxiety manifests itself in several dimensions, ranging from fear of making mistakes, difficulty understanding instructions, social anxiety, performance pressure, and emotional instability when facing learning obstacles. Although each student displays different responses, there is a consistent affective pattern characterized by fear of failure, cognitive confusion, sensitivity to social judgment, and pressure to achieve.

To illustrate, the first case, Ishak's experience, shows that the fear of making mistakes is rooted in psychological traces from previous learning experiences. Even though the teacher did not punish him, the negative memories that had formed triggered anticipatory anxiety, as demonstrated by avoidance behaviors that reinforced his internal construction of fear of making mistakes.

Second: Rendi's experience highlights that anxiety can also arise from linguistic gaps in understanding story questions. The inability to grasp the meaning of instructions causes mental blocking and increases cognitive load, thereby giving rise to situational anxiety. Teachers confirm this condition, emphasizing that limited mathematical literacy also contributes to the emergence of anxiety.

Second: In Rani's case, anxiety seems to be rooted in social sensitivity. Concerns about peer evaluation encourage excessive self-monitoring, making her hesitant to express her academic needs. The habit of repeatedly erasing her answers suggests a fear of negative evaluation, which inhibits her participation.

Elsa, on the other hand, exhibits anxiety triggered by performance pressure in a competitive environment. Social comparison shapes a negative self-perception of her math skills, which is reflected in physiological responses such as deep breathing. This reflects the emergence of academic stress due to demands for speed and accuracy.

Fifth: Rully's experience shows anxiety arising when he is unable to tolerate incomprehension at an early stage. The emotional instability that immediately arises when facing difficulties indicates weak emotional regulation skills, which, in turn, trigger avoidance behavior in mathematics learning.

Overall, these five experiences show that math anxiety is rooted in complex interactions among cognitive, emotional, and social factors and is influenced by the learning dynamics students experience.

DISCUSSION

Pedagogical Interaction Dynamics on the Construction of Affective Experiences in Elementary School

Research findings indicate that math anxiety among elementary school students is a multidimensional phenomenon shaped by interactions among cognitive processes, affective responses, and classroom social dynamics. Referring to the Cognitive Affective Theory of Learning (CATLM), various symptoms such as difficulty understanding instructions, fear of making mistakes, and pressure to work quickly indicate an imbalance between the cognitive and affective loads experienced by students (Zhu et al., 2024). These manifestations are evident in students such as Rendi, Elsa, and Ishak, who show decreased focus, physiological responses to stress, and a tendency to avoid challenging math tasks.

Thus, the form, source, and dynamics of mathematical anxiety among students at SDN 1 Kedungrejo, Probolinggo Regency, can be described as follows:

Table 3. Analysis of the Form, Source, and Dynamics of Mathematics Anxiety

Aspect	Main Findings	Phenomenological Description
Form of Anxiety	Fear of making mistakes	Students show fear of making mistakes, avoiding answering questions.
	Confusion in understanding instructions	Students experience difficulties understanding story questions, leading to cognitive anxiety.
	Social anxiety	Students are afraid of being laughed at and are embarrassed to ask questions even though they do not understand the material.
	Pressure to work quickly	Students feel left behind by their friends when given speed calculation exercises.
	Frustration with difficulty	Students show strong emotional reactions when they do not immediately understand a concept.
Sources of Anxiety	Previous negative experiences	Anxiety develops early on in school due to experiences of failure or embarrassing responses.
	Outcome-oriented learning patterns	Pressure to achieve good grades and work quickly increases students' affective burden.
	Low self-efficacy	Students feel incapable before trying, thus limiting their efforts.
	Social influence and peer comparison	Children are sensitive to peer evaluation, triggering feelings of shame or fear of making mistakes.
	Cognitive load when understanding problems	Linguistic difficulties interfere with mathematical processing, triggering anxiety.
Anxiety Dynamics	Negative cognitive-affective cycle	High affective load reduces working memory capacity, exacerbates errors, and increases anxiety.
	Avoidance behavior	Students avoid eye contact, remain silent, or delay completing tasks as a response to anxiety.
	Internalized belief: "Math is difficult"	Students develop a schema that mathematics is frightening or too difficult, thereby reducing their interest in learning.
	Emotional physiological response	Students show physical signs such as fidgeting, sighing, looking down, or holding a pencil tensely.

	Interaction between environment and self-efficacy	Anxiety increases when learning demands are not in line with the child's emotional regulation abilities.

Phenomenological analysis reveals that math anxiety among elementary school students is multidimensional, shaped by interactions among subjective experiences, pressures in the learning environment, and low academic self-confidence. Symptoms vary from fear of making mistakes and social anxiety to cognitive frustration when faced with difficult instructions or concepts. The sources of this anxiety can be traced to negative learning experiences in early grades, maladaptive self-perceptions, and learning practices that place too much emphasis on achievement. This dynamic creates a mutually reinforcing cognitive-affective cycle that leads to avoidance behaviors and the formation of recurring negative beliefs about mathematics.

Integrating these findings with Bandura's Self-Efficacy Theory, it appears that low self-efficacy is a determining factor in triggering and maintaining math anxiety (Nugraheni & Pramugita, 2025). Students with low self-efficacy, such as Rani and Rully, tend to withdraw, are reluctant to ask questions, and are easily frustrated when faced with mathematical challenges. This condition is exacerbated by unsupportive learning experiences and performative pressure in the early classroom environment (Baidhawi, 2025). This pattern is in line with the behavioral avoidance characteristics that are at the core of math anxiety and have implications for the formation of a sustained negative attitude towards mathematics learning.

The theory of math anxiety explains that mathematical anxiety is formed through repeated interactions between negative thoughts, physiological responses, and avoidance behavior (Chandra & Royanto, 2019). Observations show that students who feel pressured by the possibility of answering incorrectly or by the demands of task speed display physical symptoms such as taking deep breaths, lowering their heads, or holding writing instruments nervously. This initial affective response then increases affective arousal, which implies a decrease in working memory capacity. As a result, students find it increasingly difficult to process questions, which reinforces their belief that they are "incapable" of doing mathematics, thereby forming a negative feedback loop widely described in the literature on children's mathematical anxiety.

The dynamics of anxiety are also closely related to the design of the learning environment. Findings from school principals indicate that curriculum pressures focused on achievement scores and the speed of completion encourage teachers to adopt less humanistic approaches to learning. From a CATLM perspective, such instructional conditions increase the affective load and reinforce the cycle of anxiety that repeats from lower to higher grades (Sunarsih et al., 2025). Thus, math anxiety develops as a systemic cycle involving negative learning experiences, low self-efficacy, cognitive barriers, and avoidance behaviors, which cumulatively affect students' academic performance and long-term perceptions of mathematics.

The findings of this study confirm that the classroom environment's structure significantly contributes to the emergence of math anxiety. The principal's perspective shows that curriculum pressure that emphasizes achievement and speed of completion creates a learning climate that increases students' affective burden. From the perspective of child educational psychology, competitive learning patterns, minimal dialogic interaction, and result-oriented approaches do not provide space for exploration, tolerance of mistakes, or slower thinking rhythms that align with the cognitive development characteristics of elementary school students (Sunarsih et al., 2025).

In general, math anxiety in elementary school students cannot be understood solely as an academic ability issue, but as a multidimensional phenomenon involving cognitive, affective, social, and structural factors. The views of educational psychologists reinforce that this anxiety is the result of a complex construction that includes emotion regulation, self-perception of ability, social experiences, and instructional design in the classroom. The integration of CATLM theory, self-efficacy, and math anxiety shows that negative experiences in early grades, performative pressure, and the dynamics of interaction in the learning environment play a major role in shaping patterns of persistent anxiety. These findings emphasize the need for pedagogical

interventions that balance academic demands with emotional support and strategies to increase students' self-efficacy.

CONCLUSION

The findings of this study indicate that, (1) Mathematics anxiety in elementary students is strongly influenced by classroom interactions and the design of learning experiences. The repeated patterns seen in students' responses demonstrate that this anxiety is systemic and widespread, requiring comprehensive intervention strategies. Thematic anxiety is not only influenced by internal factors within students, but is also the result of interactions between school structure, learning culture, and curriculum pressure. (2) Mathematics anxiety is rooted in complex interactions among cognitive, emotional, and social factors and is influenced by students' learning dynamics.

Thus, math anxiety in elementary school students extends beyond academic ability, encompassing cognitive, affective, social, and learning structure factors. Key findings from educational psychology indicate that this anxiety is shaped by emotion regulation, self-competence perception, social interaction experiences, and classroom instructional design. Based on these findings, further longitudinal research is recommended to trace the development of math anxiety from the early grades. Testing interventions that focus on strengthening self-efficacy and emotional regulation is also an important agenda for assessing their effectiveness in reducing math anxiety. In addition, the use of mixed-methods approaches and the expansion of research sites to schools with diverse characteristics are necessary to produce a more comprehensive understanding and stronger generalizability.

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