

# Exploring Math Anxiety in Prospective Mathematics Teachers: A Phenomenological Study of Mathematics Education Students at Singaperbangsa Karawang University

Talenta Valentina Christi <sup>1</sup>, Annisa Maiyada <sup>2</sup>, Fitria Dwi Khaerunnisa <sup>3</sup>, Lita Dewi Firstianti <sup>4</sup>,  
Nurhaliza Salsabiela Hanum <sup>5</sup>, Rahmanda Putri <sup>6</sup>

<sup>1, 2, 3, 4, 5, 6</sup> Mathematics Education, University of Singaperbangsa Karawang, Indonesia

Email: ✉ [2210631050044student.unsika.ac.id](mailto:2210631050044student.unsika.ac.id)

Article Info	Abstract
<p><b>Article History</b> Submitted: 18-04-2026 Revised: 23-04-2026 Accepted: 24-04-2026</p>	<p>Mathematics anxiety remains a persistent challenge among prospective mathematics teachers, influencing cognitive performance, emotional regulation, and instructional readiness. However, existing studies predominantly rely on measurement-based approaches and provide limited insight into how anxiety is experienced across different academic contexts, particularly between examination and teaching situations. This study aims to investigate the lived experiences of mathematics anxiety among undergraduate students in a Mathematics Education program at Singaperbangsa Karawang University, Indonesia. A qualitative phenomenological design was employed to capture participants' subjective experiences. Participants were selected through purposive sampling based on their experience in both mathematics examinations and teaching practice. Data were collected through semi-structured, in-depth interviews, supported by a preliminary screening questionnaire, and analyzed using an interactive thematic approach. The findings reveal that mathematics anxiety is a multidimensional and context-dependent phenomenon, manifesting across four interconnected domains: cognitive, attitudinal, somatic, and mathematical knowledge. The mathematical knowledge domain emerges as the primary source of anxiety, driven by conceptual insecurity. This condition triggers a cascade of effects, disrupting cognitive processing, evoking emotional avoidance, and generating physiological responses. Anxiety is found to be more pronounced in teaching contexts, where real-time explanation and public performance intensify pressure. This study contributes by offering an integrated, experience-based understanding of mathematics anxiety, emphasizing the dynamic interaction between cognitive, affective, and contextual factors. The findings highlight the need for teacher education programs to integrate conceptual support with emotional regulation and adaptive coping strategies to enhance both learning and teaching readiness.</p>
<p><b>Keywords:</b> Math anxiety; Mathematics teachers; Phenomenological research; Coping strategies; Mathematics education</p>	

## INTRODUCTION

Mathematics anxiety has been widely recognized as a significant affective barrier that interferes with individuals' cognitive processing, problem-solving performance, and engagement in mathematical activities. Rather than merely reflecting low mathematical ability, mathematics anxiety is a complex psychological response characterized by tension, fear, and cognitive disruption when individuals are confronted with mathematical tasks. In the context of teacher education, this issue is particularly critical because it affects not only students' academic

performance but also their future instructional competence. Empirical evidence suggests that mathematics anxiety influences how students approach learning tasks, often leading them to adopt less effective strategies, such as repetitive reading rather than engaging in meaningful problem-solving (Sparks, 2022). Furthermore, experiences of anxiety are closely associated with beliefs and attitudes toward teaching mathematics, which may influence how prospective teachers design and deliver instruction in the future (Lavidas et al., 2023).

The significance of mathematics anxiety extends beyond individual learning outcomes to broader educational implications. Longitudinal findings indicate that teachers who experience higher levels of mathematics anxiety tend to demonstrate lower self-confidence in teaching mathematics and science, which may negatively affect instructional quality (Gresham, 2017). This condition can contribute to a recursive cycle in which teachers' anxiety is transmitted to students through their instructional practices, ultimately influencing students' achievement (Ramirez et al., 2018). Consequently, mathematics anxiety should be understood not only as an individual psychological phenomenon but also as a systemic issue that has implications for teaching effectiveness and educational quality. Within this perspective, addressing mathematics anxiety at the teacher preparation stage becomes essential to prevent its long-term impact on classroom practice.

In the context of teacher education, mathematics anxiety represents a particularly complex challenge due to the dual role of prospective teachers as both learners and future educators. Pre-service teachers are expected to develop deep conceptual understanding while simultaneously preparing to communicate mathematical ideas effectively. However, many studies report that prospective teachers frequently experience low confidence in their mathematical knowledge, which leads to avoidance behavior, emotional distress, and reduced instructional readiness (Rizta & Antari, 2018; Dzulfikar, 2016; Bakrin, 2023). These difficulties often emerge in high-pressure situations, such as examinations and teaching practice, where students are required to perform cognitively demanding tasks under evaluative conditions. This dual-context exposure suggests that mathematics anxiety among prospective teachers is not static but situational and context-dependent.

Although prior studies have extensively documented the prevalence, predictors, and impacts of mathematics anxiety, the literature remains largely fragmented, with cognitive, affective, and behavioral dimensions typically examined in isolation rather than as interacting processes within authentic learning experiences (Tanjung et al., 2024; Haase et al., 2019; Orbach & Fritz, 2022). Existing research has predominantly focused on identifying factors such as self-concept, achievement, and intervention outcomes, yet it offers limited insight into how these factors interact dynamically during real-time mathematical engagement (Asanjarani & Zarebaramabadi, 2021; Khasawneh et al., 2021). Moreover, recent studies that consider contextual influences—such as task difficulty, learning environment, or student resilience—tend to investigate these variables within single settings, without examining how mathematics anxiety is experienced across distinct professional contexts, particularly the transition between examination situations and teaching practice (Guo & Liao, 2025; Gülşen Turgut & Bakır, 2025; Turgut & Uğurlu, 2024). As a result, the underlying mechanisms through which mathematics anxiety develops, persists, and influences performance across both learning and instructional contexts remain insufficiently understood, highlighting a critical need for an integrated, multidimensional, and context-sensitive investigation.

Addressing these limitations, the present study adopts a phenomenological approach to investigate the lived experiences of mathematics anxiety among undergraduate students in a Mathematics Education program. Although prior research has largely relied on quantitative

approaches to examine relationships among anxiety, motivation, and performance (Li et al., 2021; Yuan et al., 2023), such measurement-based frameworks offer limited insight into how anxiety is subjectively experienced and managed in authentic academic contexts. Recent studies have conceptualized mathematics anxiety as a multidimensional construct encompassing cognitive, emotional, behavioral, and physiological components (Mammarella et al., 2023; Quintero et al., 2022; Klee et al., 2023), yet these dimensions are typically analyzed in isolation or within single contexts, such as examination settings or learning engagement (Jenifer et al., 2023; Journault et al., 2025). Furthermore, although emerging phenomenological research has begun to explore academic and pedagogical anxiety among pre-service teachers, it remains limited in its ability to capture how these dimensions interact dynamically across different professional contexts (Pahmi et al., 2025). In response, this study advances the field by examining how mathematics anxiety manifests across four interrelated domains—cognitive, attitudinal, somatic, and mathematical knowledge—within both examination and teaching situations, thereby offering a more integrated, context-sensitive, and experience-based understanding of mathematics anxiety as a dynamic and multidimensional phenomenon.

The contribution of this study lies in its multidimensional and contextualized analysis of mathematics anxiety, which highlights the dynamic interaction between cognitive processes, emotional responses, and instructional demands. By revealing how these dimensions reinforce one another across different academic contexts, this study offers a more comprehensive framework for understanding mathematics anxiety among prospective teachers. Practically, the findings are expected to inform the development of teacher education programs that not only strengthen conceptual understanding but also address affective and experiential aspects of learning. Such an approach is essential to prepare future mathematics teachers who are both cognitively competent and emotionally resilient in their professional practice.

## METHODS

This study employed a qualitative approach using a descriptive phenomenological design to explore in depth the lived experiences of mathematics anxiety among undergraduate students in mathematics education. The study focused on two authentic academic contexts, namely mathematics examinations and teaching practice, in order to capture how anxiety is experienced, interpreted, and managed across different professional demands. A phenomenological approach is particularly appropriate for investigating lived experience because it enables researchers to access participants' subjective meanings and interpret how individuals make sense of their experiences within real-life contexts (Neubauer et al., 2019). In educational research, descriptive phenomenology has been widely used to uncover how individuals experience complex phenomena, allowing for rich, experience-based insights that go beyond surface-level descriptions (Altranice & Mitchell, 2023). Moreover, prior studies have demonstrated that phenomenological inquiry is effective in capturing students' lived experiences in higher education settings, particularly in understanding how they navigate challenges across academic contexts (Marchlinska et al., 2023). Therefore, this design was considered suitable for examining mathematics anxiety as a context-dependent and experience-based phenomenon that unfolds across both examination and teaching situations.

The participants were undergraduate students enrolled in the Bachelor of Mathematics Education Program at Singaperbangsa Karawang University. A total of 100 students completed a preliminary questionnaire, which functioned as an initial screening tool to identify variations in mathematics anxiety experiences. Based on the screening results, 15 participants were selected

through purposive sampling. This sampling strategy is commonly used in qualitative research to select information-rich cases that are relevant to the research focus (Ahmad & Wilkins, 2025). The selection criteria required participants to have experienced both mathematics examinations and teaching-related activities, such as microteaching or classroom teaching practice, ensuring that the data captured a diverse range of contextual experiences of anxiety. Data collection through interviews continued until data saturation was achieved, as indicated by the absence of new emerging themes in participants' responses, a key criterion for ensuring the adequacy of qualitative data (Guest et al., 2006).

The preliminary questionnaire, distributed via Google Forms, was used solely as a screening instrument rather than for statistical generalization. Its purpose was to capture variations in students' emotional responses, attitudes, and experiences related to mathematics anxiety in both examination and teaching contexts. The use of questionnaires as a complementary tool in qualitative research can support participant selection and provide initial insights into participants' perspectives (Pitura, 2023). The primary data collection method was semi-structured, in-depth interviews, which enabled participants to articulate their experiences freely while allowing the researcher to probe for deeper insights into the cognitive, emotional, and contextual dimensions of anxiety. Semi-structured interviews are widely recognized as an effective method for exploring complex and subjective experiences, as they provide flexibility while maintaining analytical focus (Eppich et al., 2019).

Data analysis followed the interactive model proposed by Miles and Huberman, which involves data condensation, data display, and conclusion drawing. As also applied in prior research (Pitaloka & Darmawan, 2025), this model supports systematic analysis through iterative comparison across data sources. In this study, data condensation involved selecting and focusing on meaningful segments of interview transcripts directly related to participants' anxiety experiences. These segments were coded inductively and organized into initial meaning units. Through constant comparison, similar codes were grouped into broader categories, which were then developed into overarching themes representing four dimensions of mathematics anxiety: cognitive, attitudinal, somatic, and mathematical knowledge domains. Data were displayed by organizing these themes into structured narratives to identify patterns and relationships across participants. Finally, conclusions were drawn through interpretative analysis, with continuous verification across interview data and questionnaire responses to ensure analytical consistency.

To ensure trustworthiness, several strategies were implemented. Credibility was established through data triangulation by comparing findings from questionnaire responses and interview data, and through peer debriefing to validate emerging interpretations. Triangulation, as a strategy for enhancing validity by integrating multiple perspectives, strengthens the robustness of qualitative findings (Nurfajriani et al., 2024). Dependability was ensured by maintaining a detailed audit trail documenting coding processes and analytical decisions. Confirmability was addressed by preserving raw data, coding records, and reflective notes to minimize researcher bias and ensure transparency. Ethical considerations were strictly observed throughout the study. Participants were fully informed about the purpose of the research and provided informed consent prior to participation. Confidentiality was maintained by anonymizing participants' identities using coded identifiers. Participation was voluntary, and participants had the right to withdraw at any stage without any consequences.

**RESULT**

The findings of this study reveal that mathematics anxiety among undergraduate students in Mathematics Education manifests across four interrelated domains: cognitive, attitudinal, somatic, and mathematical knowledge, within two academic contexts, namely mathematics examinations and teaching practice. These domains emerged through inductive coding of interview data and were further supported by patterns identified in the preliminary questionnaire. The integration of these data sources indicates that mathematics anxiety is not a single-dimensional phenomenon but a multidimensional experience shaped by both internal and contextual factors. To provide an overview of anxiety across domains, descriptive patterns from the questionnaire are presented in Table 1. These data are not intended for statistical generalization but serve to support the qualitative interpretation of participants’ experiences.

**Table 1.** Average Mathematics Anxiety Levels by Domain

Situation	Level of Anxiety	Somatic	Cognitive	Attitudinal	Math Knowledge
Preparing for the Math Test	High	64.8%	73.3%	71.1%	88.3%
	Medium	37.5%	55.2%	47.9%	60.5%
	Low	8.2%	31.1%	17.4%	26.3%
Teaching Mathematics	High	67.2%	74.6%	72.5%	81.8%
	Medium	39.9%	44.6%	46.6%	51.7%
	Low	5.4%	14.1%	16.7%	11.5%

The pattern presented in Table 1 indicates that the mathematical knowledge domain consistently shows the highest level of anxiety across both contexts. This finding is reinforced by interview data, suggesting that uncertainty in conceptual understanding acts as a foundational source of anxiety, which subsequently influences other domains. Furthermore, anxiety levels are slightly higher in teaching contexts compared to examination situations, particularly in cognitive and attitudinal domains, indicating that performance-based and socially evaluative situations intensify anxiety experiences.

***Cognitive Domain: Disruption of Working Memory and Reasoning***

Findings show that cognitive anxiety is characterized by mental blockage, difficulty retrieving information, and impaired reasoning during both examinations and teaching. These patterns emerged consistently across participants and were supported by both questionnaire trends and interview data.

A participant explained:

*“When I faced a math problem, sometimes my mind suddenly went blank, even though I had studied before.” (P4)*

This statement reflects working memory disruption under anxiety, where previously learned information becomes inaccessible during task performance. Similar patterns were observed in teaching contexts:

*“When I had to explain in front of the class, I forgot what I wanted to say, even though I understood it before.” (P7)*

This finding indicates that cognitive anxiety extends beyond mathematical problem solving to also affect verbal reasoning and the retrieval of conceptual knowledge under conditions of

pressure. When individuals are required not only to solve problems but also to articulate explanations, anxiety imposes additional cognitive demands that compete for limited working memory resources. As a result, attention becomes divided between task execution and self-monitoring processes, such as fear of making mistakes or concern about evaluation. This dual processing load reduces the efficiency of information retrieval and disrupts the organization of ideas into coherent explanations.

Furthermore, anxiety-induced attentional overload impairs the ability to maintain structured reasoning, leading to fragmented responses, hesitation, and loss of logical sequencing during explanation. Participants who previously demonstrated understanding in low-pressure conditions often struggled to verbalize the same concepts when required to perform in front of others, indicating a gap between knowledge possession and knowledge expression. This suggests that cognitive anxiety interferes not only with what individuals know, but with how effectively they can access, organize, and communicate that knowledge in real time. Consequently, anxiety functions as a cognitive constraint that limits both problem-solving performance and instructional clarity.

#### ***Attitudinal Domain: Avoidance and Reduced Engagement***

Attitudinal anxiety is reflected in fear, avoidance behavior, and reduced motivation toward mathematics. This domain is particularly evident in participants' anticipatory responses before exams and teaching activities.

One participant stated:

*"Before the exam, I felt anxious and sometimes wanted to avoid thinking about it because I was afraid I couldn't do it."* (P2)

This indicates that anxiety influences not only emotional states but also behavioral decisions, leading to avoidance strategies. In teaching contexts, similar patterns appear:

*"When I was not confident, I tended to delay explaining and let students try first."* (P9)

This behavior reflects defensive teaching strategies, where participants attempt to minimize exposure to potential failure. The consistency of these findings across contexts suggests that attitudinal anxiety plays a central role in shaping engagement and participation.

#### ***Somatic Domain: Physiological Responses to Pressure***

Somatic anxiety is expressed through physical symptoms such as increased heart rate, trembling, shortness of breath, and cold hands. These symptoms are more pronounced during examinations, particularly under time pressure.

A participant reported:

*"My hands were cold and my heart was beating fast when the exam started."* (P6)

In teaching contexts, somatic responses tend to occur at the beginning of instruction:

*"At the beginning of teaching, I felt nervous and my voice was shaking."* (P11)

However, these symptoms often decrease as participants become more engaged and cognitively oriented toward the task, indicating a process of situational adaptation. This pattern suggests that somatic anxiety is not static but dynamically regulated over the course of performance. At the initial stage, heightened physiological responses—such as increased heart rate, trembling, and vocal instability—reflect anticipatory stress triggered by uncertainty and perceived evaluation. As the activity progresses, attention gradually shifts from self-focused concerns (e.g., fear of failure or judgment) toward task-focused processing, allowing cognitive control to stabilize physiological reactions.

This transition highlights the role of familiarity and experiential exposure in moderating somatic responses. Participants with prior teaching experience or repeated exposure to similar

situations tend to regulate their physiological symptoms more effectively, as they develop greater confidence and adaptive coping mechanisms. Conversely, individuals with limited experience may sustain elevated somatic responses for longer durations, which can interfere with verbal fluency, clarity of explanation, and overall performance. Thus, somatic anxiety can be understood as a context-sensitive and temporally evolving response, shaped by the interaction between perceived pressure, task engagement, and experiential familiarity.

#### ***Mathematical Knowledge Domain: Core Source of Anxiety***

The mathematical knowledge domain emerges as the central and most dominant source of anxiety, as consistently indicated in both questionnaire data and interview findings. Participants expressed persistent uncertainty about their conceptual understanding.

One participant stated:

*“Even after studying, I still felt unsure whether I really understood the concept.”* (P1)

This lack of confidence affects both problem-solving and teaching performance:

*“When teaching, I was afraid that my explanation might be wrong.”* (P10)

These findings indicate that conceptual insecurity operates as a primary trigger that initiates a cascading effect across multiple dimensions of mathematics anxiety. When students are uncertain about their conceptual understanding, they experience increased cognitive load, which interferes with working memory and limits their ability to retrieve and organize relevant information during problem-solving or instruction. This cognitive disruption is subsequently accompanied by affective responses such as self-doubt, fear of making mistakes, and anticipatory anxiety, particularly in situations that involve evaluation or public performance. As these emotional responses intensify, they further constrain cognitive efficiency, creating a feedback loop in which anxiety and cognitive limitation reinforce one another.

At the behavioral level, this interaction manifests in a range of coping strategies aimed at minimizing perceived risk. Participants reported relying heavily on written notes, delaying explanations, or consulting additional references before responding, indicating a preference for controlled and low-exposure actions. While these strategies may provide temporary support, they also reflect a lack of spontaneous confidence and reduce opportunities for active engagement in mathematical reasoning. In teaching contexts, such behaviors often result in reduced instructional clarity, hesitation in delivering explanations, and dependence on external aids rather than internalized understanding. Thus, conceptual insecurity not only affects individual cognition but also shapes observable teaching practices, highlighting its central role in sustaining and amplifying mathematics anxiety across contexts.

#### ***Integrated Interpretation Across Domains***

Triangulation of questionnaire and interview data indicates that mathematics anxiety is primarily driven by low confidence in mathematical knowledge, which subsequently affects cognitive processing, emotional attitudes, and physiological responses. These domains do not operate independently but form a dynamic and interrelated system. In particular, conceptual uncertainty increases cognitive load, leading to mental block and difficulty retrieving information. This cognitive disruption then triggers affective responses such as fear and avoidance, which further reduce engagement and performance. This pattern is consistently observed in both examination and teaching contexts, though it is more pronounced in teaching situations involving real-time explanation and public performance. Overall, the findings demonstrate that mathematics anxiety among prospective teachers is a multidimensional and context-dependent phenomenon, shaped by interactions among knowledge, cognition, emotion, and situational demands.

## DISCUSSION

The discussion in this study is based on the integration of questionnaire findings and in-depth interview data from undergraduate students of Mathematics Education. The results reveal that mathematics anxiety is not a uniform experience but rather a complex, multidimensional phenomenon that manifests differently across cognitive, attitudinal, somatic, and mathematical knowledge domains in both examination and teaching contexts. Rather than functioning as independent categories, these domains interact dynamically, forming an integrated system that shapes students' overall experience of anxiety. This finding aligns with contemporary cognitive-affective models, which conceptualize mathematics anxiety as the result of interactions between cognitive processes and emotional responses rather than isolated components (Johnson & D'Souza, 2025).

A central finding of this study is that the mathematical knowledge domain emerges as the primary source of anxiety. Students' lack of confidence in their conceptual understanding persists even after studying, suggesting that anxiety is not only triggered by external academic pressure but also by internalized perceptions of competence. This finding is consistent with Bakrin (2023), and further supported by recent studies showing that low self-efficacy and weak conceptual understanding significantly contribute to mathematics anxiety and reduced performance (Shimizu, 2025; Fitriyani & Agrestian, 2024). Moreover, research indicates that individuals with lower subjective numeracy tend to experience higher anxiety due to uncertainty in interpreting mathematical information (Rolison et al., 2020). However, the present study extends these findings by demonstrating that conceptual insecurity functions as a central trigger that simultaneously activates cognitive disruption, emotional avoidance, and physiological responses, indicating a more interconnected and systemic mechanism of anxiety formation.

In the cognitive domain, mathematics anxiety is expressed through mental blockage, difficulty retrieving information, and impaired reasoning, particularly under evaluative pressure. The "mind blank" phenomenon reported by participants reflects a disruption of working memory during problem-solving and teaching situations. This supports Balt et al. (2022) and more recent evidence showing that anxiety impairs working memory capacity and attentional control, thereby reducing problem-solving efficiency (Doz et al., 2024). Furthermore, attentional bias toward negative outcomes and fear of failure have been shown to intensify cognitive interference, limiting students' ability to maintain structured reasoning (Schmitz et al., 2023). However, this study also reveals variation in experience: while some students experience complete cognitive shutdown, others report partial confusion, indicating differences in anxiety intensity and cognitive resilience that are often overlooked in previous research.

The attitudinal domain further demonstrates that anxiety is not merely cognitive but also deeply affective. Fear, avoidance, and low motivation toward mathematics are consistently observed among participants, particularly before examinations and during unprepared teaching sessions. These findings align with Rizta and Antari (2018), and are further supported by evidence showing that mathematics anxiety predicts avoidance behavior and reduced engagement in learning activities (Daker et al., 2021). In addition, perfectionistic concerns and fear of making mistakes have been identified as significant contributors to anxiety in evaluative situations (Núñez-Peña & Bono, 2021). However, the present study reveals a more nuanced pattern in which avoidance is not always passive but may serve as a short-term coping strategy, such as delaying explanation or restructuring instructional steps, indicating adaptive yet limited regulatory behavior.

In the somatic domain, anxiety manifests through physiological responses such as increased heart rate, trembling, and breathing difficulties. These symptoms are more intense during

examinations compared to teaching practice, indicating that time constraints and evaluative pressure amplify physical stress responses. This finding is consistent with Dzulfikar (2016) and Cooke et al. (2011), and further supported by research demonstrating that physiological arousal is closely linked to cognitive stress and performance pressure in academic settings. However, the present study adds nuance by showing that somatic symptoms tend to decrease during teaching activities, suggesting that familiarity, engagement, and situational adaptation can moderate physiological responses. This highlights the dynamic and context-sensitive nature of somatic anxiety, rather than viewing it as a fixed reaction.

Importantly, the interaction among domains reveals that mathematics anxiety should not be understood as a set of isolated components but as a dynamic, cyclical system. Cognitive disruption, emotional avoidance, physiological stress, and low conceptual confidence reinforce one another in a feedback loop. For example, low mathematical understanding increases cognitive uncertainty, triggering fear, which in turn leads to physiological stress that further impairs performance. This recursive relationship supports contemporary views that anxiety operates as a self-reinforcing mechanism affecting both cognition and behavior (Johnson & D'Souza, 2025). Such a mechanism explains why anxiety persists across both examination and teaching contexts, even when students have prior preparation.

Another important insight from this study is the variation in student experiences. Not all participants experience anxiety with the same intensity or in the same way. Some students show high cognitive and somatic reactions, while others primarily exhibit attitudinal avoidance or mild uncertainty. This variation indicates that mathematics anxiety exists on a spectrum rather than as a uniform condition, shaped by individual differences in self-efficacy, prior experiences, and coping strategies. This finding extends previous research by emphasizing heterogeneity in anxiety profiles, which has often been overlooked in studies that rely on aggregated measures. Finally, this study contributes to the literature by highlighting mathematics anxiety as a multidimensional, interactive, and context-dependent phenomenon among prospective mathematics teachers. Unlike previous studies that tend to separate cognitive, affective, or somatic aspects, this research demonstrates their interdependence across both learning and teaching situations. Therefore, mathematics teacher education programs need to address not only conceptual mastery but also emotional regulation, cognitive resilience, and adaptive coping strategies. Strengthening these aspects is essential to break the cyclical pattern of anxiety that may otherwise persist into future teaching practice and negatively affect instructional quality.

## CONCLUSIONS

This study demonstrates that mathematics anxiety among undergraduate students in Mathematics Education is a multidimensional and context-dependent phenomenon that emerges through the dynamic interaction of cognitive, attitudinal, somatic, and mathematical knowledge domains across examination and teaching situations. The findings indicate that conceptual insecurity in mathematical knowledge functions as the primary trigger of anxiety, initiating a cascading effect that disrupts cognitive processing, evokes emotional avoidance, and generates physiological responses. These dimensions do not operate independently but form a recursive system in which cognitive overload, affective reactions, and behavioral strategies continuously reinforce one another, leading to persistent difficulties in both problem solving and instructional performance. Furthermore, the study reveals that mathematics anxiety is not uniform but varies in intensity and manifestation across individuals, reflecting differences in self-efficacy, prior experiences, and coping strategies. This variation highlights the need to conceptualize mathematics

anxiety as a spectrum rather than a fixed condition. The phenomenological approach employed in this study provides a more integrated understanding by capturing how anxiety is experienced and managed in real academic contexts, particularly in the transition between examination and teaching situations. Theoretically, this study contributes by advancing a multidimensional and interactional perspective of mathematics anxiety that bridges cognitive, affective, and contextual dimensions within a unified framework. In practice, the findings suggest that mathematics teacher education programs should move beyond a sole focus on conceptual mastery and incorporate strategies to strengthen cognitive resilience, emotional regulation, and adaptive coping mechanisms. Such an integrated approach is essential to break the cyclical pattern of anxiety and to prepare prospective teachers who are not only competent in mathematical knowledge but also confident and effective in instructional practice. Finally, this study is limited by its qualitative scope and relatively small sample size, which may restrict generalizability. Future research is recommended to examine the effectiveness of targeted interventions—such as scaffolding-based instruction, anxiety regulation training, or experience-based teaching simulations—in reducing mathematics anxiety across diverse educational contexts.

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