

Reframing Mathematics Anxiety: The Role of Emotional Intelligence and Social Support Among Students in Indonesia: A Systematic Literature Review

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Abstract

Mathematics anxiety continues to be a major challenge in education, particularly in rural contexts where learning resources are limited. This literature review explores how emotional intelligence and social support shape gender differences in mathematics anxiety among students, with a focus on Indonesian rural schools. Drawing on 35 peer-reviewed studies published between 2010 and 2024, the findings show that male students are more dependent on social support to reduce mathematics anxiety, whereas female students rely more heavily on emotional intelligence to manage emotions associated with mathematics learning. The review also highlights that the learning environment both at home and at school has a profound impact on shaping students' attitudes and resilience in mathematics. Identified gaps include limited longitudinal research, insufficient studies in rural Southeast Asian contexts, and a lack of gender sensitive intervention frameworks. This review recommends designing integrative, context-based programs that combine emotional intelligence training and strengthened social support systems to reduce mathematics anxiety.

Keywords: Mathematics_anxiety; Emotional_intelligence; Social_support; Literature_review

1. Introduction

Mathematics remains one of the most anxiety inducing subjects in education, particularly for students who lack confidence or supportive learning environments. Recent findings indicate that supportive parenting styles can significantly reduce mathematics anxiety by strengthening students' belief in their own mathematical ability, with math self-efficacy acting as a critical mediator [1]

Globally, a considerable number of students report experiencing mathematics anxiety, and this issue is equally pressing in Indonesia. Despite curriculum reforms and digital initiatives, rural students still perform lower than their urban peers due to limited resources, teacher shortages, and weaker learning support systems [2]. These disparities show that reforms alone are insufficient without tackling structural inequalities in education.

Two major protective factors consistently linked to reducing mathematics anxiety are emotional intelligence and social support. Emotional intelligence has been shown to enhance mathematics achievement by helping students regulate emotions, manage stress, and persist in problem solving [3]. Likewise, strong social connections with teachers and peers act as buffers against anxiety, with studies confirming that students with higher levels of social intelligence report lower mathematics anxiety [4].

Gender differences also shape how students cope with mathematics anxiety. Recent evidence demonstrates that male students tend to rely more on external social support, while female students benefit more from emotional intelligence in managing academic stress and regulating negative emotions [5]. Similarly, Indonesian studies show that resilience in

mathematics, combined with emotional intelligence, enables female students to adapt more effectively to challenging mathematical tasks compared to their male counterparts [6].

Local research further reinforces the role of emotional intelligence in reducing mathematics anxiety. Findings suggest that emotional intelligence not only supports stress regulation but also improves mathematical connection abilities, especially when supported by strong prior knowledge [7]. This highlights the importance of integrating cognitive and emotional skill development into mathematics instruction.

Within Indonesia's broader educational context, mathematics achievement remains a persistent concern, particularly in rural schools where structural inequalities are deeply rooted. National reforms such as the *Merdeka Belajar* program were launched to decentralize decision making, empower teachers, and promote competency-based learning. Yet these reforms are constrained by uneven teacher training, infrastructural gaps, and weak monitoring systems [8]. Shortages of qualified teachers and inequitable distribution of resources further exacerbate disparities, leaving rural students disproportionately vulnerable to mathematics anxiety [2].

Inclusive education has also been prioritized in national policy, but its implementation faces ongoing challenges. Many schools still lack adequate facilities for students with special needs, teachers often have limited training, and inconsistent policy interpretation across regions hinders effectiveness [9]. These barriers demonstrate that addressing mathematics anxiety in Indonesia requires not only emotional and social support interventions but also more equitable and effective implementation of national educational reforms.

2. Literature Review

2.1 Mathematics Anxiety

Mathematics anxiety directly undermines performance by disrupting working memory and limiting problem solving efficiency. Students with high levels of math anxiety are more likely to experience cognitive overload during problem solving, which leads to weaker outcomes in arithmetic tasks. This negative effect occurs because math anxiety reduces the storage component of working memory, a key mechanism required for mathematical reasoning [10].

2.2 Social Support and Academic Outcomes

Social support has been identified as a protective factor against academic stress and mathematics anxiety. Recent studies on rural junior high school students reveal that peer support is negatively correlated with mathematics anxiety, and that psychological resilience mediates this relationship. In other words, when students receive strong support from peers, they are more capable of withstanding stress and maintaining confidence in mathematics learning [11].

2.3 Emotional Intelligence and Learning

Emotional intelligence also plays an essential role in shaping students' mathematics outcomes. Individuals with high emotional intelligence are better at regulating their emotions, allowing them to maintain focus and persist despite difficulties. Conversely, students with high math anxiety demonstrate weaker visuospatial working memory and reduced attentional control, especially in situations with distracting emotional or spatial information. These



findings highlight that building emotional intelligence not only reduces math anxiety but also strengthens the cognitive processes necessary for learning [12].

2.4 Gender Differences in Mathematics Anxiety

Gender differences further influence how mathematics anxiety is experienced and managed. Recent evidence from senior high schools shows that female students report higher levels of mathematics anxiety and lower performance compared to their male counterparts. The negative correlation between mathematics anxiety and performance is also stronger among females, suggesting that gender sensitive approaches are crucial when designing interventions that address emotional regulation and social support in mathematics learning [13].

3. Methodology

This study follows the Systematic Literature Review (SLR) method guided by PRISMA standards.

- Databases searched: Scopus, Web of Science, ERIC, and Google Scholar.
- Keywords used: mathematics anxiety, emotional intelligence, social support, gender differences, rural students.
- Inclusion criteria: Peer reviewed articles (2010–2024); Studies linking mathematics anxiety with emotional intelligence and/or social support; Articles discussing gender differences or rural educational settings.
- Exclusion criteria: Non peer reviewed sources; Articles without empirical evidence; Studies focusing on general academic anxiety without reference to mathematics.

From 176 initial studies, 35 met the inclusion criteria. Data were synthesized through thematic analysis, focusing on the role of social support, emotional intelligence, and gender differences. This methodological approach ensured that the literature reviewed was directly aligned with the research objectives outlined in the introduction, allowing the subsequent analysis to highlight the interplay between mathematics anxiety, emotional intelligence, social support, and gender differences.

4. Result

4.1 Main Findings

The analysis confirms that mathematics anxiety continues to hinder academic performance by disrupting working memory and reducing problem solving efficiency. Students with high levels of anxiety are more likely to avoid mathematics related courses and careers, thereby perpetuating gaps in STEM participation [10].

Social support plays a crucial role in buffering these effects. In particular, peer and teacher encouragement reduces test-related stress and avoidance behavior, with male students showing greater reliance on external reinforcement from social networks [14].

Emotional intelligence emerges as a strong predictor of lower mathematics anxiety, especially among female students. Those with higher emotional intelligence are able to regulate emotions more effectively, sustain motivation, and persist in mathematical tasks despite difficulties [12].

Gender-based patterns further reinforce these findings. Male students tend to depend more on social support, while female students benefit more from emotional intelligence and

emotional regulation strategies. This aligns with recent studies showing stronger negative effects of mathematics anxiety on female students' performance compared to males [13].

Rural environments intensify mathematics anxiety due to limited teacher support, fewer peerlearning opportunities, and reduced parental involvement. Structural inequalities in rural schools such as shortages of qualified teachers and inadequate learning facilities exacerbate anxiety and reduce academic persistence [2].

Cultural context also shapes coping mechanisms. In collectivist societies such as Indonesia, social support is a central strategy for managing academic stress. However, for female students, emotional intelligence remains a more effective buffer against mathematics anxiety, suggesting the need for gendersensitive and contextspecific interventions [6] [15].

4.2 Table of Findings

Table 1. Literatur Review

Theme	Findings	Key References
Mathematics Anxiety	Negatively impacts working memory, problemsolving efficiency, and STEM	Wei (2025)
Social Support	Buffers anxiety, particularly for males; peer and teacher encouragement reduce stress.	Wang et al. (2025)
Emotional Intelligence	Enables emotional regulation and persistence; more effective for females.	Ashkenazi, Danan, & OkonSinger (2024)
Gender Differences	Males → higher dependence on social support; Females → stronger reliance on emotional intelligence.	Asomah et al. (2025)
Rural Context	Limited teacher support and resources heighten anxiety; reforms needed for equitable learning.	Jayadi, Harahap, & Aslan (2025)
Cultural Context	Collectivist cultures emphasize social support, but EI is more effective for females.	Faradillah & Wulandari (2024)

5. Discussion

The synthesis confirms that mathematics anxiety is strongly influenced by gender, emotional intelligence, and social support. Male students tend to rely more on external reinforcement from peers, teachers, and parents, while female students benefit more from internal emotion regulation skills. This shows that uniform interventions are not effective for all groups.

For rural students, limited access to teachers and learning resources further increases the importance of family and peer support. To address these challenges, interventions should:

1. Strengthen peer collaboration and parental involvement for male students.
2. Provide emotional intelligence and stress management training for female students.
3. Adapt strategies to rural contexts by integrating school, family, and community resources.

6. Conclusion

This review highlights the persistent challenge of mathematics anxiety and its strong links with emotional intelligence, social support, gender differences, and rural educational contexts. The synthesis confirms that males rely more on external reinforcement such as peer and parental support, while females benefit more from internal strategies rooted in emotional intelligence and resilience. These findings demonstrate that uniform interventions are insufficient; instead, tailored approaches sensitive to gender and cultural context are required.

In Indonesia, rural students remain disproportionately vulnerable due to structural inequalities including limited access to qualified teachers, fewer peer-learning opportunities, and weaker infrastructure. Addressing these challenges requires integrated strategies that combine school-based programs with community and family involvement. Introducing emotional intelligence training, enhancing parental engagement, and fostering peer collaboration are key steps toward reducing mathematics anxiety and supporting equitable learning outcomes.

Ultimately, the findings emphasize that reducing mathematics anxiety demands holistic, gender-sensitive, and context-specific interventions aligned with national reforms such as *Merdeka Belajar*. By embedding social and emotional support into education policy and practice, Indonesia can move closer to ensuring that mathematics becomes a subject of opportunity rather than fear for all students.

7. References

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