

A Literature Review of Factors Influencing Mathematics Anxiety Among Students

Ibnu Imam Al Ayyubi^{1*}, Firda Noer Zannah²

¹ Institut Darul Falah Bandung Barat, Indonesia; ibnuimamalayyubi@indaf.ac.id

² Institut Darul Falah Bandung Barat, Indonesia; firdanzh@gmail.com

* Corresponding Author

Received: 02-01-2026

Revised: 10-02-2026

Accepted: 02-04-2026

ABSTRACT

Mathematics anxiety is one of the affective problems that can hinder the process and outcomes of mathematics learning among elementary school students. This anxiety is not only related to the ability to understand mathematics but can also be influenced by various internal and external factors. This study aims to examine and identify the factors influencing mathematics anxiety among elementary school students based on previous research findings. This study employs a library research method by examining various scientific sources relevant to mathematics anxiety among elementary school students. The data were analyzed descriptively through a process of identification, categorization, comparison, and synthesis of findings from various sources. The literature review shows that mathematics anxiety is influenced by internal factors, such as beliefs about one's own abilities, attitudes toward mathematics, self-confidence, and experiences of difficulty and failure. External factors include teachers' teaching practices, learning experiences, classroom atmosphere, evaluation pressure, parental support, and relationships with peers. These findings highlight the importance of a comprehensive approach to reducing mathematics anxiety through learning environments that are safe, positive, and supportive of students' development from elementary school onward.

Keywords: Causal factors, Elementary school students, Literature review, Mathematics anxiety, Mathematics learning

How to Cite Last Name, x., & Last Name, x. (20xx). Title..... Title..... Title..... Title..... Title..... Title..... Title..... *Journal*, Volume(Issue), page-page. <https://doi.org/>

INTRODUCTION

Mathematics is one of the important subjects in elementary education because it plays a role in developing logical, critical, systematic thinking, and problem-solving skills (Al Ayyubi et al., 2024). Mathematical abilities acquired in elementary school provide a foundation for students to participate in learning at subsequent educational levels. However, in practice, mathematics is often perceived as a difficult subject, which can create various obstacles in both cognitive and affective aspects (AlAyyubi et al., 2025). One of the affective obstacles frequently encountered in mathematics learning is mathematics anxiety. Mathematics anxiety is a condition characterized by fear, tension, worry, or discomfort when students engage in activities related to mathematics (Nolasco, 2025; Passolunghi et al., 2020). Such anxiety may arise during lessons, while completing assignments, solving problems, or taking assessments. Mathematics anxiety deserves attention because it can affect students' concentration, motivation, self-confidence, and ability to solve mathematical problems. Studies of mathematics anxiety in elementary education indicate that this condition may be associated with students' academic achievement, motivation, and self-confidence.

Mathematics anxiety among elementary school students is not solely caused by low mathematical ability. Various studies have shown that the emergence of anxiety can be influenced by both internal and external factors. Internal factors include self-efficacy, attitudes toward mathematics, self-confidence, and experiences of difficulty or failure in mathematics learning. Students who have low confidence in their abilities tend to experience greater fear and worry when facing mathematics tasks. Conversely, strong beliefs in their own abilities can help students approach mathematical difficulties more positively. In addition to internal factors, the learning environment also plays an important role. Teachers' teaching practices, classroom atmosphere, forms of assessment, and pressure regarding speed and accuracy in solving problems can affect students' emotional conditions. A learning environment that places excessive emphasis on grades and outcomes may cause mathematics to be perceived as a stressful situation. Conversely, learning that provides students with opportunities to ask questions, try, discuss, and make mistakes as part of the learning process can help create more positive mathematics learning experiences.

Family and social environments also need to be considered. Parents' attitudes toward mathematics, the academic support they provide, and students' experiences with peers can shape their perceptions and attitudes toward mathematics. Negative parental attitudes toward mathematics may be associated with the development of mathematics anxiety in children, whereas positive support can help increase students' self-confidence. Thus, mathematics anxiety is a multifactorial problem because it involves interactions among personal, learning, family, and social environmental factors (Kurniawan et al., 2025). Although many studies on mathematics anxiety have been conducted, their findings remain distributed across various focuses and factors. Some studies emphasize psychological factors such as self-efficacy and attitudes toward mathematics, while others examine the roles of teachers, parents, classroom environments, and learning assessment. This situation indicates the need for a literature review that integrates various research findings to obtain a more comprehensive understanding of the factors influencing mathematics anxiety, particularly among elementary school students. Based on the foregoing discussion, this study aims to examine and identify the factors influencing mathematics anxiety

among elementary school students based on findings from previous studies. This review is expected to provide an understanding of the internal and external factors that contribute to the emergence of mathematics anxiety and to serve as a consideration for teachers and parents in creating more positive learning experiences that support students.

METHOD

This study employed a qualitative approach using the library research method (Niam et al., 2024). This method was used because the research data were obtained from various literature sources relevant to the topic of mathematics anxiety among elementary school students. Library research enables researchers to identify, compare, and synthesize findings from previous studies in order to obtain a more comprehensive understanding of the factors contributing to mathematics anxiety. The data sources in this study consisted of scientific journal articles, research findings, academic books, theses or dissertations, and other relevant scholarly sources. The literature search was conducted through several databases and academic search engines, including Google Scholar, Garuda, ERIC, and other scientific journal databases. The keywords used in the search process included mathematics anxiety, math anxiety, elementary students, primary school students, factors of mathematics anxiety, kecemasan matematika, siswa sekolah dasar, and faktor penyebab kecemasan matematika. The literature used in this study was selected based on several criteria. The inclusion criteria were: 1) the study discussed mathematics anxiety, 2) the research subjects were elementary school students or students in primary education, 3) the study examined factors associated with or contributing to mathematics anxiety, 4) the source was available in the form of a scientific article, thesis, dissertation, or other credible academic publication, and 5) the source contained information relevant to the research objectives. Meanwhile, literature that was unrelated to mathematics anxiety, irrelevant to the elementary education level, or did not provide information concerning the factors under investigation was not used as the main source of analysis.

The data analysis technique was conducted through several stages, namely identification, selection, categorization, analysis, interpretation, and synthesis of the literature. The literature obtained was first read and screened based on its relevance to the research objectives. Subsequently, information concerning factors related to mathematics anxiety was recorded and grouped into several categories, namely internal factors of students, family factors, teacher and learning factors, social environmental factors, and factors related to learning assessment. The findings from various studies were then compared to identify similarities, differences, and emerging patterns. The analysis was conducted descriptively and interpretively by systematically organizing findings from various sources. Therefore, the purpose of this study was not to statistically determine the magnitude of the influence of a particular factor, but rather to provide a comprehensive overview of the factors that, based on the literature, contribute to the emergence of mathematics anxiety among elementary school students.

RESULT AND DISCUSSION

RESULT

Based on a review of various studies on mathematics anxiety among elementary school students, mathematics anxiety was found to be a multidimensional phenomenon. Anxiety is not only related to students' ability to understand mathematical concepts but is also associated with how students perceive their own abilities, the mathematics learning experiences they have encountered, and how family, teachers, classrooms, and peers shape their experiences with mathematics. Systematic reviews of mathematics anxiety in elementary education also indicate that research on this topic has expanded to include psychological, cognitive, pedagogical, and environmental factors. Based on the synthesis of the literature, the identified factors can be grouped into five main categories: (1) students' psychological and cognitive factors, (2) learning experiences and processes, (3) teachers and classroom environments, (4) family and parents, and (5) peers and the social environment. These five categories do not operate independently but may interact with one another in the development and maintenance of mathematics anxiety.

Psychological and Cognitive Factors of Students

Psychological factors are among the most consistently identified factors in the literature. These factors include mathematics self-efficacy, self-confidence, attitudes toward mathematics, perceptions of one's own abilities, experiences of failure, and perceptions of the difficulty of mathematics. Mathematics self-efficacy is one of the factors that has a strong relationship with anxiety (Abdillah et al., 2025). Students who have low confidence in their abilities tend to perceive mathematics tasks as difficult and threatening (Herzamzam & Yudha, 2025). This condition may trigger worry even before students begin solving problems. Conversely, students who have stronger beliefs in their abilities tend to be better prepared to face difficulties and are less likely to avoid mathematics tasks. These findings indicate that mathematics anxiety cannot be assessed solely on the basis of students' objective abilities. Two students with relatively similar mathematical abilities may demonstrate different levels of anxiety because they hold different beliefs about their own abilities. In addition to self-efficacy, attitudes toward mathematics have also been identified as an important factor. Students with negative attitudes toward mathematics tend to perceive it as a difficult, boring, frightening subject that can only be mastered by students with certain abilities. Such perceptions may reinforce the tendency to avoid mathematical activities.

These psychological factors are also related to experiences of success and failure. Successful experiences in completing mathematics tasks can strengthen self-confidence, whereas repeated failures can reinforce doubts about one's abilities. Thus, previous academic experiences can become one of the foundations for the development of anxiety in subsequent mathematics experiences. From a cognitive perspective, several studies have also shown that the relationship between mathematics anxiety and performance cannot be separated from the cognitive processes used when performing mathematical tasks. Research involving students with low levels of mathematical development, for example, has examined mathematics anxiety together with variables such as working memory and mathematical performance within a single analytical framework. This indicates that

emotional conditions and cognitive processes may interact when students complete mathematical tasks.

Mathematics Learning Experiences

The findings indicate that students' experiences during mathematics learning are an important factor in the development of anxiety. These experiences may include success or failure in understanding material, solving problems, obtaining grades, and interacting with teachers and peers (O'Hara et al., 2022). Students who repeatedly experience difficulties without receiving appropriate assistance may develop the perception that mathematics is beyond their abilities. If such experiences persist over an extended period, academic difficulties may develop into emotional responses such as fear, tension, and avoidance. Conversely, successful experiences in completing mathematics tasks can provide *mastery experiences* that help students build confidence in their abilities. Thus, the quality of learning experiences is related not only to mastery of the material but also to the development of students' emotional well-being. These findings demonstrate that mathematics anxiety can develop gradually. Initially, students may experience difficulties only in understanding certain topics. However, when these difficulties recur and are accompanied by negative experiences, students may begin to develop the perception that they are incapable of doing mathematics. This perception can subsequently trigger anxiety when students encounter mathematics tasks again.

Teacher Factors and Teaching Practices

Teachers are an important external factor because most of students' mathematics experiences occur through interactions with teachers. The findings indicate that teaching methods, ways of explaining concepts, assignment practices, feedback, and responses to students' mistakes may be associated with mathematics anxiety. Learning that is overly oriented toward results, speed, and accuracy can place pressure on students. Under such conditions, mathematics may be perceived as an activity that requires students to always provide the correct answer. Students who require more time may feel left behind or less capable than their peers (Ayuwanti & Siswoyo, 2021). Conversely, learning that provides students with opportunities to explore various solution strategies, express their opinions, ask questions, and correct mistakes can create a safer learning experience. This is particularly important for elementary school students, who are still developing their self-confidence and perceptions of mathematics. Findings concerning the role of teachers are also evident in studies examining teachers' and parents' mathematics anxiety in relation to children's anxiety and mathematics achievement. Research involving children in grades one through three indicates that the relationship between adults' mathematics anxiety and children's anxiety and achievement may vary according to grade level and gender. This demonstrates that teachers are not merely providers of subject matter but are part of the social environment that can influence students' mathematics experiences.

Classroom Atmosphere

The findings indicate that the classroom atmosphere can influence the emergence of mathematics anxiety among students. A comfortable, safe, and supportive classroom atmosphere can encourage students to ask questions, answer questions, and attempt to solve mathematical problems without fear of making mistakes. Conversely, an overly stressful classroom atmosphere, excessive

competition, or practices of comparing students' abilities may cause students to feel afraid and less confident during mathematics learning. Students may feel embarrassed or worried when giving an incorrect answer in front of their teacher or classmates (Ghahremani et al., 2022). Thus, the classroom atmosphere can either reinforce or reduce mathematics anxiety. A positive classroom atmosphere can help students feel more comfortable learning, whereas an unsupportive classroom atmosphere can increase pressure and fear of mathematics. Therefore, creating a safe and enjoyable classroom atmosphere is important in efforts to reduce mathematics anxiety among elementary school students.

Evaluation Pressure and Time Constraints

The findings also indicate that assessment situations are one of the contexts that can trigger mathematics anxiety. Mathematics assessments can become a source of pressure when students are expected to achieve certain grades, must complete problems within a limited period, or feel that mistakes will directly affect how they are evaluated. Such pressure may be stronger among students who have previously experienced negative experiences with mathematics. When an assessment begins, students are not only trying to solve the problems but must also manage their concerns about the results they will obtain. This condition indicates that low performance in mathematics does not necessarily mean that students do not understand the material. In certain situations, emotional conditions can interfere with students' ability to use knowledge that they actually possess (Al Ayyubi & Rohmatulloh, 2023).

Family and Parental Factors

The family is the first environment that can shape students' perceptions of mathematics. The findings indicate that parents' attitudes, academic support, expectations regarding achievement, and parents' mathematics anxiety are factors that need to be considered (Sarı & Hunt, 2020). Parents who demonstrate positive attitudes toward mathematics can help children view mathematics as something that can be learned. Conversely, when parents directly or indirectly convey that mathematics is a difficult subject, children may develop similar perceptions. Szczygieł's study of elementary school children in grades one through three showed that fathers' mathematics anxiety was associated with children's mathematics anxiety under certain conditions, while mothers' and teachers' mathematics anxiety was associated with the mathematics achievement of third-grade children. These findings indicate that the influence of adults on children's mathematics experiences may differ according to student characteristics and developmental contexts. In addition to attitudes, parental academic support is also an important factor. Positively provided assistance can help children overcome difficulties. However, assistance that is overly pressuring or excessively focused on outcomes may instead create learning experiences that increase pressure.

Peers and the Social Environment

Peers are another factor that can influence students' experiences in mathematics learning. At the elementary school level, social acceptance is an important part of the learning experience (Mrope et al., 2024). Students may be afraid to answer questions or solve problems because they are concerned that their answers will be considered wrong by their peers. Peer support can have the opposite effect. Cooperation in solving mathematical problems provides students with opportunities to receive assistance, compare strategies positively, and reduce the feeling that mathematical

difficulties must be faced alone. Thus, the social environment can function as both a risk factor and a protective factor. Negative social relationships can reinforce anxiety, whereas supportive relationships can help students develop a sense of safety and self-confidence.

Individual Characteristics and Student Differences

The findings also indicate that mathematics anxiety does not always emerge in the same pattern among all students. Individual characteristics such as grade level, gender, mathematical ability, and learning experiences may be associated with anxiety levels (Pollack et al., 2021). Research examining the relationship between parents' and teachers' mathematics anxiety and children's anxiety indicates that these relationships may differ between boys and girls and across different grade levels. This demonstrates that the factors underlying mathematics anxiety need to be understood contextually and cannot be simply generalized to all elementary school students. In addition, research on the behavior of elementary school students with low mathematical development indicates that certain behaviors during learning may serve as indicators associated with mathematics anxiety. These findings demonstrate that anxiety is not always expressed through verbal statements such as "fear of mathematics" but may also be observed through certain behaviors during the learning process.

Patterns of Relationships Among Factors

The synthesis of various sources of literature indicates that the factors contributing to mathematics anxiety are better understood as a network of interacting factors rather than as isolated factors (Stella, 2022). For example, difficulty understanding the material may cause students to fail to solve problems. Repeated failure may reduce self-efficacy. Low self-efficacy may then make students increasingly fearful when facing subsequent mathematics tasks. When students begin to experience anxiety, their concentration and engagement in learning may be disrupted, thereby increasing their mathematical difficulties. A similar pattern may occur with environmental factors. Teachers who place excessive emphasis on speed may increase learning pressure. Such pressure can reinforce students' perception that mathematics is a difficult and frightening activity. Negative perceptions may then influence attitudes and self-efficacy, ultimately increasing anxiety. Family factors may also interact with internal factors. Parents' attitudes toward mathematics can influence how children perceive mathematics, while parental support can strengthen self-confidence. Thus, mathematics anxiety develops through the interaction between personal experiences and the social environment.

DISCUSSION

Based on the findings of this review, mathematics anxiety among elementary school students is a problem that is not caused by a single factor. Mathematics anxiety develops through the interaction between students' individual conditions, their experiences during the learning process, and the environment around them. Therefore, understanding mathematics anxiety requires consideration of both factors within students and environmental factors.

The Relationship Between Beliefs About One's Abilities and Mathematics Anxiety

One of the important findings of this review is the relationship between students' beliefs about their own abilities and mathematics anxiety. Students who feel

incapable of doing mathematics tend to experience greater fear when facing mathematical problems or tasks. When students already believe that they are not good at mathematics, tasks that could actually be completed may be perceived as difficult (Al Ayyubi, Nurhikmah, et al., 2025). This condition can create a recurring pattern. When students feel incapable, they become afraid to try. This fear can cause students to become less focused and less willing to ask questions when they experience difficulties. As a result, their understanding of the material may decrease further, causing them to experience difficulties again in subsequent tasks. These experiences may then reinforce the belief that they are incapable of doing mathematics. Therefore, improving mathematical abilities needs to be accompanied by efforts to strengthen students' beliefs in their own abilities. Teachers can provide tasks that are appropriate to students' abilities and gradually increase their level of difficulty, allowing students to experience success. Successful experiences in solving problems can help students develop self-confidence and reduce their fear of mathematics.

Students' Attitudes and Perceptions Toward Mathematics

In addition to beliefs about their own abilities, students' attitudes toward mathematics also play an important role. Students who initially perceive mathematics as a difficult or frightening subject are more likely to experience anxiety when dealing with mathematics. These perceptions may develop from previous learning experiences, both personal experiences and influences from people around them. Negative attitudes toward mathematics may also cause students to avoid activities related to mathematics. The more frequently mathematics is avoided, the fewer opportunities students have to experience success. This may reinforce the perception that mathematics is indeed difficult and that they are incapable of learning it. These findings indicate that mathematics learning in elementary school should not only aim to improve students' computational and problem-solving abilities but should also build positive experiences with mathematics (Al Ayyubi, Rohaendi, et al., 2025). Teachers can use examples related to students' everyday lives, games, group activities, and various other activities that allow students to see that mathematics can be learned through an enjoyable process.

Learning Experiences and Failure in Mathematics

Previous learning experiences are one of the factors that can explain the emergence of mathematics anxiety (Ramadhani & Rezkillah, 2025). Students who frequently experience failure when solving mathematics problems may become more afraid when facing subsequent tasks. Repeated failure without adequate assistance may lead students to conclude that they are indeed incapable of doing mathematics. However, failure does not always cause anxiety. The impact of failure depends greatly on how the failure is understood and addressed. When mistakes are viewed as part of the learning process and students are given opportunities to correct their mistakes, such experiences can instead become opportunities for learning. Therefore, teachers need to change the perception that mistakes in mathematics are something to be feared. Students should be given opportunities to try again and understand where their mistakes occurred. This approach can help reduce fear while improving students' mathematical problem-solving abilities.

The Role of Teachers and Teaching Practices

Teachers play an important role in shaping students' experiences with mathematics. The way teachers explain material, assign tasks, ask questions, and

respond to students' answers can influence their emotional condition during learning. Learning that places excessive emphasis on correct answers, speed in solving problems, and achievement of high grades can create pressure on students. Students who need more time may feel that they are less capable than their classmates. If this condition continues, students may become afraid when participating in mathematics learning (Fisher & Frey, 2021). Conversely, teachers who provide students with opportunities to think, ask questions, discuss, and try different solution strategies can create more positive learning experiences. Teachers' responses to mistakes are also very important. When mistakes are addressed in a supportive manner, students are more willing to try. Conversely, responses that make students feel embarrassed or afraid may discourage them from participating. Therefore, teachers do not merely serve as providers of subject matter but also help develop students' self-confidence in learning mathematics.

Classroom Atmosphere and Peer Relationships

The classroom atmosphere also plays a role in the emergence of mathematics anxiety. Students find it easier to learn when they feel safe and comfortable asking questions or providing answers. Conversely, a stressful atmosphere, excessive competition, or frequent comparisons of students' abilities may make them afraid of making mistakes. Peer relationships can also reinforce these conditions. Students who have been teased for being unable to answer mathematics problems may become more afraid to participate in subsequent learning activities. Conversely, supportive peers can help students feel more comfortable when facing difficulties. This indicates that creating a positive learning atmosphere is not solely the responsibility of teachers but also requires positive relationships among students (Zheng, 2022). Well-directed and supportive group learning activities can be one way to build positive social experiences in mathematics learning.

Pressure in Mathematics Assessment

Assessment is an inseparable part of learning, but the way assessment is conducted can affect students' emotional conditions. Tests with strict time limits, expectations of achieving high grades, and pressure to answer quickly can increase tension, particularly among students who already experience mathematics anxiety. Under such conditions, students are not only thinking about how to solve the problems but also about the possibility of receiving a low score or making mistakes. Such worries can interfere with concentration, preventing students from demonstrating their actual mathematical abilities. Therefore, assessment at the elementary school level should not focus solely on final outcomes. Teachers can use various forms of assessment that also consider students' thinking processes, efforts, and development. In this way, assessment can become part of the learning process rather than always being perceived as a frightening situation.

The Role of Parents in Shaping Mathematics Experiences

The family is an environment that influences how students perceive mathematics. Parents' attitudes toward mathematics may be indirectly imitated by their children (Cui et al., 2021). If parents frequently demonstrate that mathematics is a difficult subject or make children feel that they must always achieve high grades, this may increase the pressure experienced by children. Conversely, parents can help reduce anxiety by providing support when children experience difficulties. Children need to understand that mistakes and difficulties are part of the learning process.

Parental assistance should not focus solely on obtaining the correct answer but also on children's efforts and the process they use to solve problems. Thus, the role of parents is not limited to helping children complete homework but also includes developing positive perceptions of mathematics. Appropriate support can help children feel that mathematical difficulties are something that can be overcome.

Interrelationships Among Factors in the Development of Anxiety

The most important finding of this review is that the factors contributing to mathematics anxiety are interconnected. Factors within students can be influenced by their learning experiences and the environment around them. For example, students who repeatedly experience difficulties in mathematics may receive low grades. If these experiences are accompanied by pressure from teachers or parents, students may begin to doubt their abilities. Doubts about one's abilities can then make students increasingly afraid of mathematics. This fear may cause students to avoid tasks, ask fewer questions, and become less engaged in learning. Reduced engagement may subsequently lead to lower levels of mathematical understanding. Thus, mathematics anxiety can form a self-reinforcing cycle. Conversely, this cycle can be interrupted through positive learning experiences. When students receive support, have opportunities to experience success, feel safe making mistakes, and receive assistance when experiencing difficulties, their beliefs in their abilities can increase. Increased confidence can help students approach mathematics more calmly.

Implications for Mathematics Learning in Elementary Schools

Based on the findings of this review, efforts to reduce mathematics anxiety need to be implemented comprehensively. Teachers can create more interactive learning environments, provide students with opportunities to try, and use mistakes as part of the learning process. Learning should also take students' differences in ability into account so that the tasks provided do not create excessive pressure. In addition, teachers need to pay attention to how feedback is provided. Praise and feedback should not only be given when students obtain correct answers but also when they demonstrate effort, use appropriate strategies, or show improvement. This can help students understand that mathematical ability can develop through the learning process (Samritin et al., 2023).

Parents also play a role in creating positive mathematics experiences at home. Support, guidance, and good communication can help children face difficulties without feeling afraid or pressured. Through cooperation among teachers, parents, and the school environment, students can receive more consistent support in dealing with mathematics learning. Overall, this discussion indicates that mathematics anxiety among elementary school students needs to be understood as the result of interactions among various factors. Psychological factors, such as beliefs about one's abilities and attitudes toward mathematics, interact with learning experiences, teaching practices, classroom atmosphere, assessment systems, parental support, and peer relationships. Therefore, efforts to reduce mathematics anxiety should not focus solely on improving academic abilities but should also create learning experiences that are safe, positive, and supportive of students' development of self-confidence.

CONCLUSION

Based on the results of the literature review, it can be concluded that mathematics anxiety among elementary school students is a complex problem that cannot be explained solely by students' ability to understand mathematics. Mathematics anxiety develops through the interaction of various factors originating from within students themselves as well as from the environments in which they learn and develop. Therefore, mathematics anxiety needs to be understood as a problem involving psychological aspects, learning experiences, the learning process, and students' social environment. The internal factors identified include beliefs about one's own abilities, attitudes toward mathematics, self-confidence, perceptions of the difficulty of mathematics, and experiences of difficulty or failure. Students who have low confidence in their abilities and perceive mathematics as a difficult subject tend to be more vulnerable to experiencing anxiety. Repeated experiences of failure may also reinforce the perception that students are incapable of doing mathematics. Such conditions can create a cycle involving low self-confidence, fear of mathematics, avoidance of tasks, and decreasing engagement in learning.

In addition to internal factors, external factors also play an important role. Teachers' teaching practices, their responses to students' mistakes, forms of assessment, classroom atmosphere, parental support, and relationships with peers can influence students' emotional experiences in learning mathematics. Learning that places excessive emphasis on speed, accuracy, and grades can increase pressure, particularly for students with different abilities or learning rates. Conversely, learning that provides opportunities to ask questions, try, discuss, make mistakes, and correct mistakes can help create more positive learning experiences. This review also shows that these factors do not operate independently. Environmental conditions can influence students' psychological conditions, while students' psychological conditions can affect their responses to the learning environment. For example, experiences of failure in mathematics accompanied by environmental pressure can reduce students' confidence in their abilities. Low self-confidence can then increase fear when students face subsequent mathematics tasks. Conversely, support from teachers and parents, along with successful experiences in completing tasks, can strengthen self-confidence and help reduce anxiety. Thus, mathematics anxiety can either develop or decrease through a recurring process.

Based on these findings, efforts to overcome mathematics anxiety among elementary school students need to be comprehensive and should not focus solely on improving academic abilities. Teachers need to create learning environments that provide a sense of safety and opportunities for students to develop according to their abilities. Mistakes should be viewed as part of the learning process rather than something to be feared. Assessment should also be conducted proportionally to avoid placing excessive pressure on students. In the family environment, parents need to provide support and avoid imposing pressure that may cause children to perceive mathematics as something frightening. Ultimately, creating positive mathematics learning experiences from elementary school onward is an important step in preventing the development of mathematics anxiety at subsequent educational levels. Students need not only the ability to solve mathematical problems but also the confidence that they are capable of learning, trying, and correcting their mistakes. Therefore, cooperation among teachers, parents, schools, and the social environment

is necessary to create mathematics learning that is more comfortable, supportive, and responsive to students' needs. This study has limitations because it relies on findings from previous studies; therefore, the findings obtained depend heavily on the characteristics, contexts, and results of the studies reviewed. Accordingly, future research could conduct more specific investigations based on grade level, student characteristics, or particular types of factors, as well as conduct field research to further examine the relationships between these factors and mathematics anxiety among elementary school students.

ACKNOWLEDGMENT

The authors would like to express their gratitude to all parties who provided support and guidance throughout the completion of this study. Appreciation is also extended to the researchers and authors of previous scholarly works whose research findings served as references in the preparation of this literature review. It is hoped that this study will contribute to the development of mathematics education, particularly in understanding and reducing mathematics anxiety among elementary school students.

REFERENCES

- Abdillah, P. S., Alfitriani, N., Muhtar, F. A., Nugroho, M. P., & Lisnawati, I. (2025). Efikasi Diri Sebagai Faktor Keberhasilan Dalam Psikolinguistik. *Jurnal Bastra (Bahasa Dan Sastra)*, 10(3), 901–911. <https://doi.org/10.36709/bastra.v10i3.1375>
- Al Ayyubi, I. I., Nurhikmah, N., Prayetno, E., Mahrus, M. M., & Rizkiani, H. (2025). Between Numbers and Logic: How Are Mathematics and Science Learning Outcomes Related? *JENIUS (Journal of Education Policy and Elementary Education Issues)*, 6(2), 119–134. <https://doi.org/10.22515/jenius.v6i2.11303>
- Al Ayyubi, I. I., Rohaendi, N., Herdiansyah, R., & Puspita, T. (2024). *Implementasi Model Problem Based Learning Pada Pembelajaran Matematika*.
- Al Ayyubi, I. I., Rohaendi, N., Prayetno, E., Masfuroh, A. S., Al-Ghatnaini, R. A. S., & Saelaemae, T. (2025). Application of Geogebra in Mathematics Learning Using a Realistic Mathematics Education Model. *Journal of Teaching and Learning*, 1(2), 125–138.
- Al Ayyubi, I. I., & Rohmatulloh, R. (2023). Penerapan Pendekatan Model-Eliciting Activities untuk Meningkatkan Kemampuan Berpikir Kritis dan Kreatif Siswa. *Jurnal El-Audi*, 4(1), 1–12. <https://doi.org/10.56223/elaudi.v4i1.70>
- AlAyyubi, I., Nurfajriyah, D., Nurhikmah, N., Prayetno, E., & Yumna, H. (2025). Does the Learning Environment Affect Students' Mathematics Achievement? *Wulang: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, 3(2), 19–29.
- Ayuwanti, I., & Siswoyo, D. (2021). Teacher-Student Interaction in Mathematics Learning. *International Journal of Evaluation and Research in Education*, 10(2), 660–667.
- Cui, Y., Zhang, D., & Leung, F. K. S. (2021). The Influence of Parental Educational Involvement in Early Childhood on 4th Grade Students' Mathematics Achievement. *Early Education and Development*, 32(1), 113–133. <https://doi.org/10.1080/10409289.2019.1677131>
- Fisher, D., & Frey, N. (2021). *Better learning through structured teaching: A framework for the gradual release of responsibility*. ASCD.

- Ghahremani, P., Monirpour, N., & ZARGHAM, H. M. (2022). Presenting a Model of Relationships Between Classroom Perception, Self-Regulation, Students and Math Anxiety in High School Students. *Journal: Sociology of Education*, 7(2), 320–333. <https://www.sid.ir/paper/1062762/en>
- Herzanzam, D. A., & Yudha, C. B. (2025). *Revolusi Belajar Matematika SD: Kekuatan Pembelajaran Berbasis Masalah dalam Menggempur Rasa Takut dan Membangkitkan Motivasi serta Self-Efficacy*. Penerbit K-Media.
- Kurniawan, W., Ayuningsih, R. F., Al Ayyubi, I. I., Putra, A. L. T., & binti Ab Rahman, S. F. (2025). Integrating Islamic Cultural Values in Mathematics: A Historical Reflection on the Islamic Golden Age. *Jazirah: Jurnal Peradaban Dan Kebudayaan*, 6(1), 174–199. <https://doi.org/10.51190/jazirah.v6i01.215>
- Mrope, F. M., Kira, E. S., & Deogratias, E. (2024). The Influence of Peer Groups on The Academic Performance of University Students in Mathematics Courses. *International Journal of Research in Mathematics Education*, 2(2), 149–162. <https://doi.org/10.24090/ijrme.v2i2.10861>
- Niam, M. F., Rumahlewang, E., Umiyati, H., Dewi, N. P. S., Atiningsih, S., Haryati, T., Magfiroh, I. S., Anggraini, R. I., Mamengko, R. P., & Fathin, S. (2024). *Metode Penelitian Kualitatif*.
- Nolasco, D. (2025). Unearthing Mathematics Anxiety: a Qualitative Exploration of Student Experiences. *Journal of Technology and Science Education*, 15(2), 223–239. <https://doi.org/10.3926/jotse.2950>
- O'Hara, G., Kennedy, H., Naoufal, M., & Montreuil, T. (2022). The role of the classroom learning environment in students' mathematics anxiety: A scoping review. *British Journal of Educational Psychology*, 92(4), 1458–1486. <https://doi.org/10.1111/bjep.12510>
- Passolunghi, M. C., De Vita, C., & Pellizzoni, S. (2020). Math Anxiety and Math Achievement: the Effects of Emotional and Math Strategy Training. *Developmental Science*, 23(6), e12964. <https://doi.org/10.1111/desc.12964>
- Pollack, C., Wilmot, D., Centanni, T. M., Halverson, K., Frosch, I., D'Mello, A. M., Romeo, R. R., Imhof, A., Capella, J., Wade, K., Al Dahhan, N. Z., Gabrieli, J. D. E., & Christodoulou, J. A. (2021). Anxiety, Motivation, and Competence in Mathematics and Reading for Children With and Without Learning Difficulties. *Frontiers in Psychology*, Volume 12. <https://doi.org/10.3389/fpsyg.2021.704821>
- Ramadhani, N., & Rezkillah, I. I. (2025). Dari Mimpi Buruk Ke Pemahaman: Studi Pustaka Tentang Fenomena Math Anxiety dalam Pembelajaran Matematika. *Journal of Independent Education*, 1(2), 1–14. <https://ejournal.icmandiri.com/index.php/jied/article/view/228>
- Samritin, S., Natsir, S. R., Manaf, A., & Sari, E. R. (2023). The effect of realistic mathematics education implementation in mathematics learning in elementary school. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, 13(1), 81–88. <https://doi.org/10.30998/formatif.v13i1.16522>
- Sari, M. H., & Hunt, T. E. (2020). Parent-Child Mathematics Affect as Predictors of Children & Mathematics Achievement. *International Online Journal of Primary Education*, 9(1), 85–96. <https://dergipark.org.tr/en/download/article-file/2405931>
- Stella, M. (2022). Network psychometrics and cognitive network science open new ways for understanding math anxiety as a complex system. *Journal of Complex*

Networks, 10(3). <https://doi.org/10.1093/comnet/cnac012>

Zheng, F. (2022). Fostering Students' Well-Being: The Mediating Role of Teacher Interpersonal Behavior and Student-Teacher Relationships. *Frontiers in Psychology*, Volume. <https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2021.796728>



© 2026 by the authors. Submitted for possible open-access publication under the terms and conditions of the Creative Commons Attribution (CC-BY-SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>).