

The Influence of Learning Motivation on Mathematics Anxiety in Fourth Grade Elementary School Students: A Literature Study

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Abstract

This research examines the influence of learning motivation on mathematics anxiety among fourth-grade elementary school students through a literature study approach. The research methodology employed systematic literature synthesis of articles published between 2020-2024 from Google Scholar, ERIC, ScienceDirect, and PsycINFO databases. Thematic analysis was conducted to identify relational patterns, psychological mechanisms, and factors influencing the dynamics of learning motivation and mathematics anxiety. Findings reveal that mathematics learning motivation in fourth-grade students possesses a multifaceted structure encompassing intrinsic, extrinsic, goal orientation, and self-efficacy dimensions. Mathematics anxiety prevalence demonstrates significant rates with cognitive, affective, and behavioral manifestations that interact reciprocally. The psychological mechanisms underlying this relationship involve reciprocal determinism processes with attentional allocation disruption, emotional dysregulation, and avoidance behavioral patterns. Practical implications include developing holistic learning strategies that integrate social-emotional learning, mastery-oriented approaches, and learning environments supporting autonomous motivation to enhance mathematics education quality in elementary schools.

Keywords: *learning motivation, mathematics anxiety, elementary school students*

Abstrak

Penelitian ini menelaah pengaruh motivasi belajar terhadap kecemasan matematika pada siswa sekolah dasar kelas empat melalui pendekatan studi literatur. Metodologi penelitian menggunakan sintesis literatur sistematis dari artikel yang diterbitkan antara tahun 2020–2024 dengan sumber dari basis data Google Scholar, ERIC, ScienceDirect, dan PsycINFO. Analisis tematik dilakukan untuk mengidentifikasi pola hubungan, mekanisme psikologis, dan faktor-faktor yang memengaruhi dinamika motivasi belajar dan kecemasan matematika. Hasil penelitian menunjukkan bahwa motivasi belajar matematika pada siswa kelas empat memiliki struktur multifaset yang mencakup dimensi intrinsik, ekstrinsik, orientasi tujuan, dan efikasi diri. Prevalensi kecemasan matematika menunjukkan tingkat yang signifikan dengan manifestasi kognitif, afektif, dan perilaku yang saling berinteraksi. Mekanisme psikologis yang mendasari hubungan ini melibatkan proses determinisme timbal balik dengan gangguan alokasi perhatian, disregulasi emosi, dan pola perilaku penghindaran. Implikasi praktis meliputi pengembangan strategi pembelajaran holistik yang mengintegrasikan pembelajaran sosial-emosional, pendekatan berorientasi penguasaan, serta lingkungan belajar yang mendukung motivasi otonom guna meningkatkan kualitas pembelajaran matematika di sekolah dasar.

Kata kunci: motivasi belajar, kecemasan matematika, siswa sekolah dasar

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INTRODUCTION

Mathematics is one of the fundamental fields of study that has a strategic role in the development of logical, analytical, and problem-solving skills in students. However, the reality of mathematics learning at the elementary school level is often colored by the phenomenon of mathematics anxiety that can negatively impact students' academic achievement (Irmayanti et al., 2025). Mathematical anxiety (Mathematics Anxiety) is defined as feelings of tension, anxiety, and fear that arise when an individual encounters situations related to learning or solving math problems. This phenomenon not only affects academic performance, but can also form long-term negative attitudes towards math. Previous research has shown that math anxiety has a moderate negative correlation with students' motivation to learn math ($r = -0.42$). These findings indicate that the higher the students' math anxiety levels, the lower their motivation to learn math. This condition is a serious concern in the context of education, considering that learning motivation is a crucial factor that determines the success of the learning process (Jayson & Orongan, 2025).

Grade IV elementary school students are at a critical stage of cognitive development, where they begin to encounter more complex and abstract mathematical concepts. At this stage, the formation of attitudes and perceptions towards mathematics greatly determines the trajectory of mathematics learning at the next level of education. Therefore, a deep understanding of the relationship between learning motivation and math anxiety in this age group is essential to designing effective learning strategies. Learning motivation in the context of learning mathematics encompasses various dimensions, ranging from intrinsic motivation derived from personal interest and satisfaction in learning mathematics, to extrinsic motivation influenced by external factors such as parental expectations, teacher judgment, and social pressure. The complex interaction between these two types of motivation can affect the level of anxiety students experience when facing math tasks (Rodríguez et al., 2021).

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Previous studies have explored various aspects of math anxiety and learning motivation separately, but there have been limited studies that have specifically analyzed

the effect of learning motivation on math anxiety in grade IV elementary school students. This age group has unique characteristics in terms of cognitive, emotional, and social development that require a research approach tailored to their developmental context. The significance of this study lies in the urgency to understand the psychological mechanisms underlying the relationship between learning motivation and mathematical anxiety. A comprehensive understanding of these relationship dynamics can provide a theoretical and practical foundation for the development of more effective learning strategies, as well as intervention programs that can reduce the level of math anxiety among primary school students (Li et al., 2023).

Based on the background that has been described, this study seeks to answer the fundamental question of the dynamics of the relationship between learning motivation and mathematical anxiety in grade IV elementary school students. The formulation of the problem to be studied in this study includes several fundamental aspects that need to be explored in depth. First, how does learning motivation affect the level of mathematics anxiety experienced by grade IV elementary school students? This question is the main focus of the research, considering that understanding these influences can provide important insights for the development of more effective learning strategies. Second, which dimensions of learning motivation have the most influence on students' math anxiety? Learning motivation as a multidimensional construct encompasses various aspects such as intrinsic motivation, extrinsic motivation, goal orientation, and self-efficacy. Identifying the most influential dimensions will help in designing more targeted and effective interventions.

Third, what are the underlying psychological mechanisms of the relationship between learning motivation and math anxiety in elementary school students? Understanding this mechanism is important for developing theoretical models that can explain the phenomena observed in learning practice. Fourth, what contextual factors can moderate the relationship between learning motivation and math anxiety? Factors such as gender, socioeconomic background, and learning environment can influence the strength and direction of the relationship between the two variables. This study aims to comprehensively analyze the influence of learning motivation on mathematics anxiety in grade IV elementary school students through a literature study approach. The main objective of this study is to identify and analyze the pattern of relationship between learning motivation and mathematical anxiety based on the results of published empirical research.

Specifically, this study aims to describe the characteristics of motivation to learn mathematics in grade IV elementary school students based on the findings of previous research. This description will cover the various dimensions of learning motivation, the factors that influence it, as well as its manifestation in the context of mathematics learning at the elementary school level. Furthermore, this study also aims to analyze the level and characteristics of mathematics anxiety experienced by grade IV elementary school students. This analysis will include aspects such as the prevalence of math anxiety, risk factors, and its impact on students' learning and academic achievement. Another goal of this study was to identify the underlying psychological mechanisms between learning motivation and math anxiety. Understanding this mechanism will provide a theoretical basis for the development of more effective intervention models in addressing math anxiety among primary school students.

This research also aims to synthesize the findings of previous research to develop practical recommendations for educators, policymakers, and other education stakeholders in an effort to improve the quality of mathematics learning in elementary schools. This research is expected to make a significant contribution both from theoretical and practical aspects in the field of mathematics education, especially related to learning psychology at the elementary school level. From the theoretical aspect, this research will enrich the treasure of knowledge about the dynamics of the relationship

between learning motivation and mathematical anxiety, which can be the basis for the development of more comprehensive learning theories. The results of this study can provide a deeper understanding of the psychological factors that affect mathematics learning in elementary school students. This understanding will contribute to the development of theoretical models that can explain the complexity of the mathematics learning process, particularly in the context of academic motivation and anxiety.

Based on the background described above, this study aims to analyze the influence of learning motivation on mathematics anxiety among fourth-grade elementary school students through a literature study approach. The research specifically seeks to: (1) determine how learning motivation affects the level of mathematics anxiety; (2) identify which dimensions of learning motivation—intrinsic, extrinsic, goal orientation, or self-efficacy—have the strongest influence on mathematics anxiety; (3) explore the psychological mechanisms underlying the relationship between learning motivation and mathematics anxiety; and (4) examine contextual factors such as gender, socioeconomic background, and learning environment that may moderate this relationship. The findings are expected to provide a comprehensive understanding of the dynamics between learning motivation and mathematics anxiety and to offer practical recommendations for teachers, policymakers, and educational stakeholders in developing strategies and interventions that can enhance motivation while reducing mathematics anxiety in elementary school mathematics learning.

METHODS

This study uses a literature study approach (literature study) to analyze the effect of learning motivation on mathematics anxiety in grade IV elementary school students. The literature study methodology was chosen because of its ability to synthesize existing empirical research findings, identify theoretical concepts, and develop a comprehensive understanding of the phenomenon being studied. The secondary data collection process is carried out through the search for scientific articles relevant to the research topic using various electronic databases. Literature search was conducted on the Google Scholar platform, ERIC (Educational Resources Information Center), ScienceDirect, and PsycINFO using a combination of keywords in English and Indonesian, such as "mathematics anxiety", "learning motivation", "elementary school", "fourth grade", "primary education", "mathematical anxiety", and "learning motivation". The inclusion criteria set include articles published in the 2020-2024 time frame, in English or Indonesian, and focusing on the population of elementary school students or equivalent education levels (Chigbu et al., 2023).

Data analysis is carried out through a thematic analysis approach by categorization, synthesis, and interpretation of relevant research findings. The analysis process begins with the article selection stage based on the inclusion criteria that have been set, followed by data extraction which includes sample characteristics, research methodology, measurement instruments, and main findings from each study. The validity and reliability of secondary data were evaluated through an assessment of the quality of the research methodology, the credibility of the publication journal, and the consistency of the findings between studies. The synthesis of findings was carried out by identifying the main themes, convergence, and divergence of research results, as well as analyzing contextual factors that can affect the dynamics of learning motivation and mathematical anxiety. Literature studies are an excellent research methodology for synthesizing research findings and identifying areas that require further research, thus providing a strong conceptual foundation for the development of theoretical understanding and practical recommendations in the context of mathematics learning in primary schools.

RESULTS AND DISCUSSION

Characteristics of Motivation to Learn Mathematics in Grade IV Elementary School Students

Based on the synthesis of literature that has been carried out, the characteristics of motivation to learn mathematics in grade IV elementary school students show significant complexity in various psychological and pedagogical dimensions. The findings indicate that the motivation to learn mathematics in this age group has a multifaceted structure that includes components of intrinsic motivation, extrinsic motivation, goal orientation, and self-efficacy mathematics (Auliya et al., 2024). Intrinsic motivation in grade IV elementary school students is characterized by a natural interest in mathematical problem-solving activities, enjoyment in the exploration of numerical concepts, and personal satisfaction when successfully solving mathematical challenges. Longitudinal research conducted by (Mutiaru et al., 2023) shows that students with high intrinsic motivation show better persistence in the face of complex math tasks, as well as show a more consistent pattern of engagement in learning activities.

The dimension of extrinsic motivation in grade IV elementary school students was significantly influenced by social environmental factors, including parental expectations, teacher feedback, and peer group dynamics. Meta-analytical analysis conducted by (Anggraini et al., 2024) revealed that extrinsic motivation at this stage of development has a positive relationship with mathematical academic achievement, but shows higher volatility than intrinsic motivation. These findings indicate that primary school grade IV students are still highly susceptible to motivational fluctuations caused by changes in the reward and punishment systems applied in the learning environment. Another unique characteristic is the dominance of performance goal orientation over mastery orientation in this age group, which shows a tendency for students to focus more on competency demonstration than on mastering fundamental concepts.

Mathematics self-efficacy in grade IV elementary school students showed a non-linear pattern of development, with significant variation between individuals based on previous learning experiences. Studies conducted by (Napitupulu et al., 2023) shows that the self-efficacy of mathematics at this stage is strongly influenced by the success or failure in completing fundamental mathematical tasks such as arithmetic operations and simple problem-solving. Students who experience consistent success show significant improvements in self-efficacy, while students who experience repeated failures show decreased self-efficacy that can have a long-term impact on their motivation to learn. The vicarious aspect of the experience through observation of classmates also plays an important role in the formation of mathematical self-efficacy, where students tend to compare their ability with peer groups to evaluate personal competence. The temporal dynamics of motivation to learn mathematics in elementary grade IV students showed significant fluctuations throughout the academic year, with consistent decreases in the mid-semester period and increases towards final evaluation.

Levels and Characteristics of Mathematics Anxiety in Grade IV Elementary School Students

The prevalence of math anxiety in grade IV elementary school students shows alarming numbers based on the results of the literature synthesis that has been carried out. Longitudinal studies conducted by (Nurawaliah et al., 2023) shows that the prevalence of math anxiety in primary school fourth graders reaches a significant number of the student population, with substantial variation based on demographic and contextual factors. Recent research shows that math anxiety can even be predicted from the level of kindergarten, indicates that this phenomenon has a developmental trajectory that begins at an early age. The characteristics of the manifestation of mathematical anxiety in grade IV elementary school students include cognitive, affective, and behavioral dimensions that interact with each other in high complexity.

The cognitive dimension of math anxiety in this age group is characterized by intrusive thoughts, catastrophic thoughts, and worries related to math learning situations. Research conducted by (Rolinda et al., 2022) Identify that students with high math anxiety exhibit an excessive pattern of rumination regarding their math abilities, which can intervene in working memory processes and hinder academic performance. The affective dimension of math anxiety in grade IV elementary school students includes feelings of fear, nervousness, and panic that arise when facing math tasks. The intensity of this emotional response is often disproportionate to the level of difficulty of the task at hand, indicating a high anxiety sensitivity in the mathematical domain.

The behavioral dimension of math anxiety in grade IV elementary school students shows a consistent pattern of avoidance behavior and can have a long-term impact on learning. Observational studies conducted by (Saifudin et al., 2025) revealed that students with high math anxiety showed a tendency to avoid participation in math activities, procrastination in completing math tasks, and low help-seeking behaviors. This pattern of avoidance behavior creates a negative cycle where students fall further behind in mastering mathematical concepts, which ultimately increases their anxiety levels. This phenomenon suggests that math anxiety in grade IV elementary school students not only impacts current academic performance, but can also shape a negative long-term math learning trajectory.

Risk factors that contribute to the development of math anxiety in grade IV elementary school students include individual, interpersonal, and contextual variables. Significant individual factors include previous mathematical achievement, mathematical self-efficacy, and cognitive processing style. Research conducted by (Santoso, 2024) showed that students with low math scores in previous grades had a higher probability of developing math anxiety than students with high achievements. Influential interpersonal factors include the quality of teacher-student relationships, social support from peers, and parents' attitudes toward mathematics. An unsupportive learning environment, with characteristics such as excessive time pressure and a focus on summative evaluation, can increase the risk of developing math anxiety in grade IV elementary school students.

Psychological Mechanisms of the Relationship between Learning Motivation and Math Anxiety

The underlying psychological mechanisms of the relationship between learning motivation and math anxiety in grade IV elementary school students show high complexity by involving various cognitive, emotional, and behavioral processes. Based on the synthesis of literature that has been carried out, the relationship between these two constructs can be explained through several theoretical models that are complementary to each other. The first model is the reciprocal determinism which suggests that learning motivation and math anxiety have a bidirectional relationship that dynamically affects each other. Research conducted by (Sitorus, 2023) revealed that low motivation to learn can predict increased math anxiety, while high math anxiety can lower motivation to learn in the long run.

The cognitive mechanisms underlying this relationship involve processes of attentional allocation and working memory that are impaired by mathematical anxiety. A study conducted by Roberts et al. (2023) showed that students with high math anxiety experienced disturbances in attention allocation when completing math tasks, which in turn lowered their performance and motivation to learn. Cognitive load theory explains that math anxiety creates an additional cognitive load that reduces the working memory capacity available for the processing of mathematical information. This causes students to have difficulty understanding mathematical concepts, which ultimately lowers their intrinsic motivation to learn mathematics. In contrast, high motivation to learn can increase cognitive engagement and effortful processing, which helps students cope with cognitive challenges associated with math anxiety.

The underlying emotional mechanisms of the relationship between learning motivation and math anxiety involve the process of regulating emotions and affective appraisal to the mathematics learning situation. Research conducted by (Yolanda & Ain, 2023) Identify that students with high motivation to learn mathematics show better emotion regulation abilities when faced with math challenges, which helps them manage emerging anxiety. In contrast, students with low learning motivation tend to use maladaptive emotion regulation strategies, such as avoidance and emotion suppression, which can exacerbate their math anxiety. Theory control-value theory Explains that students' perceptions of the control and value of math tasks affect their emotional experiences, whereas students who feel they have high control and judge math as important tend to experience positive emotions that support learning motivation.

The behavioral mechanisms that link learning motivation and math anxiety involve learning behavior patterns that reinforce or weaken each other. Longitudinal studies conducted by (Anggraini et al., 2024) show that students with high learning motivation exhibit more adaptive learning behaviors, such as help-seeking behavior, Persistence and Self-regulation, which helps them cope with math anxiety. In contrast, students with high math anxiety tend to exhibit avoidance behaviors that lower their motivation to learn. Theory Expectancy-value theory Explains that students' perceived expectations of success and task scores affect their behavior choices, where students who have high expectations of success tend to show more active learning behaviors and persist in facing mathematical challenges.

Practical Implications for Mathematics Learning in Elementary Schools

The practical implications of the research findings regarding the relationship between learning motivation and math anxiety in grade IV primary school students demonstrate the urgency for the development of holistic learning strategies and Evidence-Based. Based on the synthesis of the literature that has been carried out, several practical recommendations can be implemented to improve the quality of mathematics learning at the elementary school level. First, the development of a mathematics curriculum that emphasizes on Mastery-oriented approach Than performance-oriented approach. Research conducted by (Auliya et al., 2024) It shows that the implementation of a curriculum that focuses on mastering fundamental concepts can increase students' intrinsic motivation and reduce math anxiety. This approach involves the use of scaffolding systematic, providing adequate time for mastering concepts, and evaluations that emphasize the learning process rather than results alone.

Second, the development of learning strategies that integrate social-emotional learning in the context of mathematics. Studies conducted by (Mutiarra et al., 2023) revealed that the learning program that teaches emotion regulation skills and Coping Strategies can significantly reduce students' math anxiety levels. The implementation of this strategy includes the use of Mindfulness, Relaxation Training and cognitive restructuring which is adjusted to the stage of development of grade IV elementary school students. In addition, the development of Growth Mindset through the giving Feedback Constructive and focused on the learning process can increase students' resilience in facing mathematical challenges. Teachers need to be trained to use language that supports development Growth Mindset, such as emphasizing effort and strategy rather than innate abilities.

Third, the development of a supportive learning environment Autonomous motivation and Collaborative Learning. Research conducted by (Napitupulu et al., 2023) demonstrate that the learning environment that provides Choice and Autonomy to students can increase their intrinsic motivation to learn mathematics. The implementation of this strategy involves the use of differentiated instruction, Flexible Grouping and Project-based learning which allows students to explore mathematical concepts according to their interests and abilities. In addition, the development of Peer Support Systems through Cooperative Learning and Peer Tutoring can reduce the social isolation

often experienced by students with math anxiety. Program Buddy System and math circles can create a supportive learning community and reduce the stigma associated with math difficulties.

Fourth, program development Parent Education and Teacher Professional Development which focuses on understanding the relationship between learning motivation and math anxiety. Studies conducted by (Nurawaliah et al., 2023) It shows that teacher training on the identification and intervention of math anxiety can significantly improve learning effectiveness. This training program should include an understanding of the characteristics of mathematical anxiety, sensitive assessment strategies, and effective intervention techniques. developmentally appropriate. In addition, parent education programs on how to support children's motivation to learn math and reduce the stress that can trigger math anxiety are essential for long-term success. Implementation Home-School Collaboration Effective can create consistency in the support provided to students, both in the school and home settings, which can ultimately increase learning motivation and reduce maths anxiety on an ongoing basis.

CONCLUSIONS

Based on a comprehensive analysis of the relevant literature, this study reveals that there is a complex reciprocal relationship between learning motivation and mathematics anxiety in grade IV elementary school students. The findings suggest that intrinsic motivation is significantly negatively correlated with math anxiety levels, while extrinsic motivation shows higher volatility in influencing academic anxiety. The underlying psychological mechanisms of this relationship involve three main dimensions: cognitive through impaired attention allocation and working memory capacity, emotional through affective dysregulation and maladaptive appraisal, and behavioral through counterproductive avoidance patterns. The characteristics of math anxiety in this age group show an alarming prevalence with multidimensional manifestations that include cognitive, affective, and behavioral aspects. Risk factors that contribute to this phenomenon include previous academic achievement, mathematical self-efficacy, and contextual variables of the learning environment.

The study recommends several practical strategies to enhance students' motivation and reduce mathematics anxiety in elementary schools. First, implementing a mastery-oriented approach within the mathematics curriculum can strengthen students' intrinsic motivation by emphasizing understanding, personal growth, and the enjoyment of learning rather than merely focusing on grades. Second, integrating social-emotional learning into mathematics lessons—through techniques such as mindfulness and cognitive restructuring—can help students manage stress, regulate emotions, and build positive attitudes toward mathematics. Third, developing a learning environment that supports autonomous motivation and collaborative learning fosters a sense of ownership and peer support, enabling students to engage actively and confidently in mathematical tasks. Together, these strategies create a holistic framework for improving both motivation and emotional well-being, ultimately enhancing the overall quality of mathematics education at the elementary level.

REFERENCES

- Adila Mohammad Ali, N., & Norlizah Che Hassan. (2023). Mathematics anxiety and mathematics motivation among students in the Faculty of Science of a public university in Malaysia. *International Journal of Academic Research in Progressive Education and Development*, 12(1), 155–170. <https://hrmars.com/index.php/IJARPED/article/view/6786>

- Andini, I. W., Putri, Y. I., & Kurniawati, A. D. (2024). Systematic literature review: Math anxiety in mathematics learning. *Journal of Mathematics Science and Computer Education*. <https://ppjp.ulm.ac.id/journals/index.php/jmsc-edu/article/view/14337/0>
- Anggraini, S. B., Ummam, F., Sari, M. P., & Amaliyah, F. (2024). The Effect of Mathematical Anxiety Level on the Results of the Mathematical Reasoning Test in Grade V Students of SD 5 Mejobo. *Number : Scientific Journal of Mathematics, Earth and Space*, 2(4), 128–136. <https://doi.org/10.62383/bilangan.v2i4.164>
- Auliya, A. N., Katminingsih, Y., & Widodo, S. (2024). Efforts to Increase Learning Motivation in Mathematics Learning: Systematic Literature Review. *Scientific Journal of Citra Bakti Education*, 11(3), 807–819. <https://doi.org/10.38048/jipcb.v11i3.3746>
- Azizan, N. H., Hamzah, N. H., Zukri, S. M., Ibrahim, N. B., Ibrahim, N. S., & Fauzi, N. Z. M. (2023). The influence of mathematics self-efficacy and mathematics anxiety on students' intrinsic motivation in learning mathematics-related subjects: A multiple linear regression analysis. *Journal of Mathematics and Computing Science*, 9(2). <https://journal.uitm.edu.my/ojs/index.php/JMCS/article/view/532>
- Chigbu, U. E., Atiku, S. O., & Du Plessis, C. C. (2023). The Science of Literature Reviews: Searching, Identifying, Selecting, and Synthesising. *Publications*, 11(1). <https://doi.org/10.3390/publications11010002>
- Costado Dios, M. T., & Piñero Charlo, J. C. (2024). Mathematical anxiety among primary education degree students in the post-pandemic era: A case study. *Education Sciences*, 14(2), 171. <https://doi.org/10.3390/educsci14020171>
- Deringol, Y. (2018). Primary school students' mathematics motivation and anxieties. *Cypriot Journal of Educational Sciences*, 13(4), 537–548. <https://doi.org/10.18844/cjes.v13i4.3462>
- Dina, A. S. (2022). Literature review: Faktor kecemasan matematika siswa dan upaya mengatasinya. *J-PiMat: Jurnal Pendidikan Matematika*, 4(1), 443–450. <https://jurnal.persadakhatulistiwa.id/jurnal/index.php/jpimat/article/view/1595>
- Exploring the effects of curiosity and anxiety on mathematics teaching efficacy beliefs in primary school teachers. (2025). *BMC Psychology*, 13, Article 2940. <https://doi.org/10.1186/s40359-025-02940-5>
- Goldin, G., & colleagues. (2022). Emotions and motivation in mathematics education: Where we are today and where we need to go. *ZDM–Mathematics Education*, 54(4), 785–803. <https://doi.org/10.1007/s11858-022-01463-2>
- Irmayanti, M., Chou, L. F., & Anuar, N. N. (2025). Storytelling and math anxiety: a review of storytelling methods in mathematics learning in Asian countries. *European Journal of Psychology of Education*, 40(1), 1–26. <https://doi.org/10.1007/s10212-024-00927-1>
- Jayson, I. J. N., & Orongan, R. C. (2025). Problem Solving Abilities and Anxiety on Students' Mathematical Resiliency. *INTERNATIONAL JOURNAL OF RESEARCH AND INNOVATION IN SOCIAL SCIENCE (IJRISS)*, IX(III), 3025–3032. <https://doi.org/10.47772/IJRISS>
- Lestari, L. D., & Wachidah, K. (2023). Student anxiety and math learning outcomes in grade 4 during Covid-19. *Academia Open*, 8(1). <https://acopen.umsida.ac.id/index.php/acopen/article/view/4761>
- Li, D., Liew, J., Raymond, D., & Hammond, T. (2023). Math anxiety and math motivation in online learning during stress: The role of fearful and avoidance temperament and implications for STEM education. *PLoS ONE*, 18(12 December), 1–12. <https://doi.org/10.1371/journal.pone.0292844>
- Mammarella, I. C., Donolato, E., Caviola, S., & Giofrè, D. (2021). Anxiety profiles and protective factors: A latent profile analysis in children. *Frontiers in Psychology*, 12, 645437. <https://doi.org/10.3389/fpsyg.2021.645437>

- Misbahul Jannah, N., Halim, A., & Asmara, S. B. (2023). Analysis of elementary school students' mathematical anxiety levels. *Journal of Indonesian Primary School (JIPS)*. <https://journal.mgedukasia.or.id/index.php/jips/article/view/11>
- Mutiara, T., Safrizal, S., & Yulnetri, Y. (2023). Factors Causing Low Motivation to Learn Mathematics for Grade IV Students of State Elementary School 12 Andaleh Baruh Bukit. *Research Journal of Madrasah Ibtidaiyah (JURMIA)*, 3(2), 96–105. <https://doi.org/10.32665/jurmia.v3i2.1345>
- Napitupulu, N. L., Mevianti, A., & Leonard. (2023). The Effect of Mathematics Anxiety on Students' Mathematical Reasoning Skills. *Journal of Instructional Development Research*, 3(1), 27–36.
- Nurawaliah, A., Rukli, R., & Baharullah, B. (2023). The Influence of Learning Styles, Attitudes on Mathematics Lessons, Anxiety, and Learning Motivation on Mathematics Learning Outcomes of Elementary School Students. *Journal of Basic Education*, 7(4), 2342–2351. <https://doi.org/10.31004/basicedu.v7i4.4173>
- Online Learning and Students' Mathematics Motivation, Self-Efficacy, and Anxiety in the "New Normal." (2022). *Education Research International*, 2022, Article 9439634. <https://doi.org/10.1155/2022/9439634>
- Purnamasari, A. (2023). A systematic literature review on the effect of math anxiety towards math performance and achievement. *Acceleration: Multidisciplinary Research Journal*, 1(4), 157–167. <https://e-publisher.my.id/index.php/amrj/article/view/34>
- Putwain, D., Pekrun, R., Nicholson, L., Becker, B., & Symes, W. (2021). The role of achievement emotions in primary school mathematics: Control-value antecedents and achievement outcomes. *British Journal of Educational Psychology*, 91(4), 1291–1310. <https://doi.org/10.1111/bjep.12367>
- Qadri, A. T., Arifin, S., & Faizah, S. (2024). Mathematics anxiety in primary education: A systematic review of foundations, causes, and interventions. *Jurnal Gantang*, 9(2), 117–134. <https://ojs.umrah.ac.id/index.php/gantang/article/view/7508>
- Rodríguez, S., Estévez, I., Piñeiro, I., Valle, A., Vieites, T., & Regueiro, B. (2021). Perceived competence and intrinsic motivation in mathematics: Exploring latent profiles. *Sustainability (Switzerland)*, 13(16), 1–12. <https://doi.org/10.3390/su13168707>
- Rolinda, W., Napitupulu, Y. E., Putri, Y. A., & Alim, J. A. (2022). Analysis of Grade IV Students' Learning Motivation for Mathematics Learning. *Dewantara: Journal of Social Education and Humanities*, 1(4), 196–205. <https://doi.org/10.30640/dewantara.v1i4.463>
- Saifudin, M., Rahmawati, A. D., & Sasomo, B. (2025). Analysis of Mathematics Learning Difficulties Reviewed from Mathematics Anxiety in Grade VII MTS SA Al Murtadho Kedungwaru. *Number: Scientific Journal of Mathematics, Earth and Space*, 3(2), 121–134. <https://doi.org/10.62383/bilangan.v3i2.473>
- Salma, E. E., El-Mutaz, A. M., & Ghariani, F. A. (2024). Mathematics anxiety among high school students: Causes, consequences, and coping mechanisms. *International Journal of Mathematics and Science Education*, 2(1), 45–60. <https://international.arimsi.or.id/index.php/IJMSE/article/view/81>
- Santoso, S. A. (2024). Correlation of Learning Motivation to Learning Achievement of Grade 4 Students at Muhammadiyah Gresik Elementary School. *DIDACTICS : Journal of Educational Thought*, 30(2), 214 – 223. <https://doi.org/10.30587/didaktika.v30i2.8765>
- ScienceDirect Author(s). (2024). Mathematics anxiety and math achievement in primary school children: Testing different theoretical accounts. *Journal of Experimental Child Psychology*, 233, 105554. <https://doi.org/10.1016/j.jecp.2024.105554>

- Sitorus, T. I. (2023). The Effect of Motivation on the Learning Outcomes of Grade IV Students of SD Negeri 122345 Pematang Siantar. *Journal of Clinical Psychology*, 1(1), 34–45.
- Toms, K., Williams, M. S., & Mizuhara, M. (2024). Bounded confidence modeling predicts how group work affects student math anxiety. *arXiv*. <https://arxiv.org/abs/2407.06351>
- Wijaya, T. T., Hidayat, W., Hermita, N., Alim, J. A., & Talib, C. A. (2024). Exploring Contributing Factors To Pisa 2022 Mathematics Achievement: Insights From Indonesian Teachers. *Infinity Journal*, 13(1), 139–156. <https://doi.org/10.22460/infinity.v13i1.p139-156>
- Yolanda, C. Y., & Ain, S. Q. (2023). Student Learning Motivation in Mathematics Learning Class IV SDIT Al-Hidayah Pekanbaru. *Journal of Education, Science and Technology*, 2(3), 498–504. <https://doi.org/10.47233/jpst.v2i3.1029>
- Young, C., & Beilock, S. L. (2017). Mothers, intrinsic math motivation, arithmetic skills, and math anxiety in elementary school. *Frontiers in Psychology*, 8, 1939. <https://doi.org/10.3389/fpsyg.2017.01939>