

HUMANISTIC PEDAGOGICAL STRATEGIES IN REDUCING MATH ANXIETY IN ELEMENTARY SCHOOL MATHEMATICS LEARNING

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis strategi pedagogis humanis dalam mengurangi *math anxiety* pada pembelajaran matematika di sekolah dasar. Penelitian menggunakan pendekatan studi kasus kualitatif dengan melibatkan 15 partisipan yang terdiri atas kepala sekolah, guru, dan siswa di SD Negeri 58 Banda Aceh. Data dikumpulkan melalui wawancara mendalam, observasi partisipatif, dan analisis dokumen. Analisis data dilakukan menggunakan model interaktif melalui proses reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian menunjukkan bahwa kecemasan matematika siswa dipengaruhi oleh pengalaman belajar negatif, rasa takut melakukan kesalahan, dan rendahnya kepercayaan diri dalam pembelajaran matematika. Strategi pedagogis

humanis yang diterapkan guru meliputi komunikasi empatik, pembelajaran kolaboratif, penguatan positif, dukungan emosional, dan pembelajaran kontekstual. Strategi tersebut terbukti mampu menciptakan lingkungan belajar yang lebih nyaman, meningkatkan partisipasi siswa, serta mengurangi rasa takut dan tekanan selama pembelajaran matematika. Penelitian ini juga menemukan bahwa hubungan interpersonal yang positif antara guru dan siswa berkontribusi terhadap peningkatan motivasi dan rasa percaya diri siswa dalam belajar matematika. Meskipun demikian, implementasi strategi humanis masih menghadapi kendala berupa keterbatasan pelatihan guru terkait aspek emosional pembelajaran dan keterbatasan waktu pembelajaran di kelas. Penelitian ini menegaskan pentingnya integrasi pendekatan pedagogis humanis dalam pembelajaran matematika sekolah dasar untuk mendukung perkembangan akademik dan emosional siswa secara seimbang.

ABSTRACT

This study aims to analyze humanistic pedagogical strategies in reducing math anxiety during mathematics learning in elementary schools. The study employed a qualitative case study approach involving 15 participants consisting of a principal, teachers, and students at SD Negeri 58 Banda Aceh. Data were collected through in-depth interviews, participant observation, and document analysis. Data analysis was conducted using an interactive model involving data reduction, data display, and conclusion drawing. The findings reveal that students' math anxiety was influenced by negative learning experiences, fear of making mistakes, and low self-confidence during mathematics instruction. Humanistic pedagogical strategies implemented by teachers included empathetic communication, collaborative learning, positive reinforcement, emotional support, and contextual

learning. These strategies were found to create a more comfortable learning environment, increase student participation, and reduce fear and emotional pressure during mathematics lessons. The study also found that positive interpersonal relationships between teachers and students contributed significantly to improving students' motivation and self-confidence in learning mathematics. However, the implementation of humanistic strategies still faced several challenges, including limited teacher training regarding emotional aspects of instruction and limited classroom learning time. This study highlights the importance of integrating humanistic pedagogical approaches into elementary mathematics learning to support both students' academic and emotional development in a balanced manner.

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INTRODUCTION

Mathematics plays a fundamental role in elementary education because it develops logical reasoning, critical thinking, problem-solving abilities, and numeracy competencies required for daily life and future academic success. In the context of 21st-century education, mathematics learning is expected not only to strengthen cognitive achievement but also to foster creativity, communication, collaboration, and emotional resilience among learners. Nevertheless, mathematics continues to be perceived by many elementary school students as one of the most difficult and stressful subjects in school. This perception frequently contributes to the emergence of *math anxiety*, a psychological condition characterized by feelings of tension, fear, worry, and helplessness when students engage in mathematical activities (Szczygieł, 2020). Recent international studies indicate that math anxiety negatively affects students' academic performance, mathematical reasoning, self-confidence, and long-term attitudes toward learning mathematics (Namkung et al., 2022; Zhang et al., 2023). Consequently, addressing math anxiety has become an important issue in educational research and instructional practice, particularly at the elementary school level where students' learning attitudes are initially formed.

Math anxiety has been recognized as a multidimensional phenomenon influenced by cognitive, emotional, social, and pedagogical factors. Students with high levels of anxiety often avoid mathematical tasks, experience difficulty concentrating, and demonstrate lower achievement compared to students with lower anxiety levels (Foley et al., 2021). In elementary classrooms, anxiety frequently emerges due to negative learning experiences, fear of making mistakes, excessive teacher control, and classroom environments that emphasize performance rather than understanding (Akin & Kurbanoglu, 2021). Moreover, teacher-centered instructional methods and rigid assessment practices may unintentionally create emotional pressure that discourages students from actively participating in

mathematics learning (Mutodi & Ngirande, 2020). Educational psychologists argue that repeated negative emotional experiences in mathematics can gradually shape students' beliefs that they are incapable of succeeding in the subject, ultimately weakening motivation and self-efficacy (Ramirez et al., 2021). These findings suggest that mathematics learning should not merely prioritize procedural mastery but also consider students' emotional well-being and psychological safety in classroom interactions.

The issue of math anxiety is particularly relevant in Indonesia, where students' mathematical literacy remains relatively low according to international assessments such as the Programme for International Student Assessment (PISA). Several studies have reported that Indonesian elementary school students frequently experience moderate to high levels of anxiety during mathematics lessons, particularly when dealing with problem-solving tasks and examinations (Nurhayati et al., 2022; Wahyudi & Anugraheni, 2021). This condition is often associated with conventional teaching practices that focus heavily on memorization, speed, and correct answers rather than conceptual understanding and meaningful learning experiences (Sari et al., 2023). Furthermore, limited emotional interaction between teachers and students may reduce students' confidence to ask questions or express difficulties during classroom activities (Pratiwi & Muhsetyo, 2022). As a result, many students develop negative perceptions toward mathematics from an early age, which may continue into higher educational levels. Therefore, there is a growing need for instructional approaches capable of creating supportive and emotionally responsive mathematics learning environments in elementary schools.

One approach considered relevant to overcoming math anxiety is humanistic pedagogy. Humanistic pedagogy emphasizes student-centered learning, emotional support, empathy, self-actualization, and positive interpersonal relationships within educational settings (Joseph, 2020). In mathematics education, a humanistic pedagogical approach encourages teachers to view students as whole individuals with emotional and psychological needs rather than merely recipients of academic content. Humanistic learning environments prioritize respect, collaboration, encouragement, and appreciation of students' learning processes, including mistakes and struggles experienced during mathematical activities (Yuliana et al., 2023). According to Ryan and Deci (2020), supportive classroom relationships significantly contribute to students' intrinsic motivation and emotional engagement in learning. Therefore, implementing humanistic pedagogical strategies may help reduce emotional barriers and promote more positive attitudes toward mathematics among elementary school students.

Previous studies have demonstrated that supportive and empathetic teaching practices can effectively reduce students' anxiety levels in mathematics learning. For example, collaborative learning, peer tutoring, reflective discussions, and contextual problem-solving activities have been shown to increase students' confidence and participation during mathematics instruction (Ritter et al., 2021). Similarly, emotionally supportive classroom communication enables students to feel safer when expressing confusion or making mistakes during learning activities (Bhowmik et al., 2021). Research conducted by Villavicencio and Bernardo (2021) also revealed that teachers' emotional support positively predicts students' mathematics self-efficacy and learning persistence. In addition, the integration of humanistic principles into mathematics instruction has been associated with increased student engagement, reduced stress, and improved classroom interaction quality (Kusmaryono et al., 2022). These findings indicate that pedagogical strategies emphasizing empathy and emotional connection may contribute significantly to reducing math anxiety in elementary education.

Despite the increasing attention to math anxiety and emotional aspects of learning, existing studies still reveal several limitations. Most previous research has primarily focused on identifying the causes and effects of math anxiety quantitatively, while fewer studies have explored pedagogical strategies specifically designed to address emotional barriers in mathematics classrooms (Namkung et al., 2022). In the Indonesian context, research discussing humanistic pedagogy in mathematics learning remains relatively limited and often concentrates on general character education rather than specific strategies for reducing math anxiety (Wahyuni et al., 2021). Furthermore, previous studies rarely investigate how teachers practically implement humanistic approaches in everyday classroom interactions, particularly at the elementary school level. This condition indicates a significant research gap concerning the integration of humanistic pedagogical strategies into mathematics instruction to reduce students' emotional distress and anxiety.

Another important gap concerns the limited exploration of students' emotional experiences during mathematics learning from a pedagogical perspective. Many studies focus predominantly on cognitive achievement and assessment outcomes while paying less attention to emotional dynamics occurring in classroom environments (Foley et al., 2021). In reality, emotional experiences strongly influence students' willingness to participate, ask questions, solve problems, and persist when facing mathematical challenges (Ryan & Deci, 2020). Without emotionally supportive learning environments, students may continue to perceive mathematics as threatening and stressful regardless of improvements in

instructional materials or curriculum design. Therefore, further research is necessary to understand how humanistic pedagogical practices can shape positive emotional experiences and reduce anxiety among elementary school students during mathematics learning.

Based on these issues and research gaps, this study aims to analyze humanistic pedagogical strategies used in elementary mathematics learning to reduce students' math anxiety. Specifically, the study investigates how teachers create emotionally supportive classroom environments, implement empathetic communication, encourage active participation, and foster students' confidence during mathematics instruction. This study is expected to contribute theoretically to the development of humanistic mathematics education literature and practically to provide recommendations for teachers, school leaders, and policymakers in designing more inclusive and emotionally responsive mathematics learning practices in elementary schools. By emphasizing the importance of emotional well-being alongside academic achievement, this research seeks to support the development of more meaningful and humane mathematics education for young learners.

RESEARCH METHODOLOGY

This study employed a qualitative research design using a case study approach to explore humanistic pedagogical strategies in reducing math anxiety among elementary school students. A qualitative case study was considered appropriate because it allows researchers to examine social and educational phenomena deeply within their natural contexts, particularly classroom interactions and students' emotional experiences during mathematics learning (Creswell & Poth, 2021). The study focused on understanding how teachers implement humanistic pedagogical practices and how these practices influence students' emotional responses toward mathematics learning in elementary classrooms. Through this approach, the research was able to capture participants' perspectives, behaviors, and learning experiences comprehensively and contextually.

The research was conducted at SD Negeri 58 Banda Aceh involving 15 participants selected purposively based on their relevance to the research objectives. The participants consisted of one principal, eight elementary school teachers, and six students who actively participated in mathematics learning activities. Purposive sampling was used because qualitative research emphasizes information-rich participants who possess direct experience related to the phenomenon being investigated (Patton, 2020). The selected participants were considered capable of providing detailed information regarding

mathematics learning processes, students' emotional conditions, and the implementation of humanistic pedagogical strategies within the classroom environment.

Data collection was carried out through in-depth interviews, participant observation, and document analysis. Semi-structured interviews were conducted to explore participants' perceptions, experiences, and views regarding math anxiety and humanistic teaching practices. Classroom observations were conducted during mathematics learning activities to identify teacher-student interactions, emotional classroom climate, and students' behavioral responses during instruction. In addition, document analysis was used to examine lesson plans, teaching materials, classroom assessment documents, and school policies related to mathematics instruction. The use of multiple instruments enabled data triangulation, which strengthened the credibility and trustworthiness of the research findings (Merriam & Tisdell, 2021).

The primary research instruments included interview guidelines, observation sheets, and document analysis checklists developed based on indicators of math anxiety and humanistic pedagogy found in previous educational studies. Interview guidelines focused on students' emotional experiences, teachers' instructional strategies, classroom communication patterns, and supportive learning practices. Observation sheets were used to record classroom interactions, teacher feedback, students' participation, and emotional responses during mathematics lessons. To ensure validity and reliability, the instruments were reviewed by educational experts and revised according to suggestions before being implemented in the field (Miles et al., 2020).

Data analysis in this study used an interactive qualitative analysis model consisting of data condensation, data display, and conclusion drawing. The collected data were first transcribed, organized, and categorized according to recurring themes related to humanistic pedagogical strategies and math anxiety reduction. Subsequently, the data were interpreted through thematic analysis to identify patterns, relationships, and meanings emerging from participants' experiences and classroom observations. Data triangulation from interviews, observations, and documentation was applied to enhance the accuracy and consistency of findings (Braun & Clarke, 2021). The analysis process was conducted continuously throughout the research to ensure that interpretations remained grounded in the collected data and accurately reflected the participants' perspectives.

RESULTS AND DISCUSSION

The findings of this study reveal that the implementation of humanistic pedagogical strategies in mathematics learning contributed positively to reducing students' math

anxiety in elementary school classrooms. Based on classroom observations, interviews, and document analysis conducted at SD Negeri 58 Banda Aceh, the study identified several forms of humanistic pedagogical practices, including empathetic teacher communication, supportive classroom interaction, collaborative learning activities, emotional reinforcement, and student-centered instructional approaches. These practices created a more comfortable and psychologically safe learning environment, enabling students to participate more actively during mathematics instruction.

The interview results showed that many students initially perceived mathematics as a frightening subject associated with pressure, fear of mistakes, and negative evaluation from teachers or peers. Several students admitted experiencing nervousness when asked to solve mathematical problems in front of the class. One student explained that they often felt anxious because they were afraid of giving incorrect answers and being laughed at by classmates. Similar findings were observed during classroom activities, where some students hesitated to ask questions or express opinions during mathematics lessons. This condition reflects the argument proposed by Ashcraft and Krause (2021), who stated that math anxiety often emerges from negative emotional experiences and fear of failure in academic settings. In elementary education, repeated exposure to stressful learning situations may gradually reduce students' confidence and willingness to engage in mathematical activities.

However, the findings also demonstrated that teachers who applied humanistic pedagogical strategies were able to reduce students' anxiety levels significantly. Teachers frequently used encouraging language, provided emotional support, appreciated students' efforts, and emphasized that mistakes were a natural part of the learning process. During observations, teachers avoided humiliating students for incorrect answers and instead guided them patiently toward understanding mathematical concepts. This approach helped students feel emotionally secure and more confident when participating in classroom discussions. According to Rogers' humanistic learning theory, supportive interpersonal relationships and unconditional positive regard are essential elements in developing students' self-confidence and emotional well-being within educational environments (Rogers, 2020). The findings of this study confirm that emotionally supportive teacher behavior can positively influence students' attitudes toward mathematics learning.

Another important finding concerns the implementation of collaborative learning activities as part of humanistic pedagogy. Teachers frequently organized students into

small discussion groups where they could solve mathematical problems cooperatively. Through peer interaction, students appeared more relaxed and willing to express difficulties without fear of judgment. Interviews revealed that students felt more comfortable learning mathematics with classmates because they could help each other understand difficult concepts. This finding is consistent with Vygotsky's social constructivist theory, which emphasizes that learning occurs effectively through social interaction and collaborative problem-solving within supportive environments (Vygotsky, 2021). Collaborative learning not only improved conceptual understanding but also reduced emotional pressure experienced by students during mathematics instruction.

The study further found that teachers attempted to connect mathematical concepts with students' daily experiences to create more meaningful learning. For example, teachers used contextual examples involving shopping activities, games, and everyday situations familiar to elementary students. Observations indicated that contextual learning activities increased students' engagement and reduced feelings of tension during lessons. Students became more enthusiastic and actively involved in solving problems when mathematical tasks were linked to real-life situations. This finding supports Bruner's constructivist learning theory, which argues that students understand concepts more effectively when learning materials are connected to concrete experiences and active discovery processes (Bruner, 2020). Meaningful learning experiences may therefore contribute to reducing anxiety because students perceive mathematics as understandable and relevant rather than abstract and intimidating.

In addition, emotional reinforcement emerged as a significant component of humanistic pedagogical practice. Teachers consistently provided praise, motivation, and positive feedback during classroom activities, even when students experienced difficulties in solving mathematical problems. Positive reinforcement appeared to strengthen students' confidence and encourage them to continue participating in learning activities. Several students stated that they became less afraid of mathematics because their teachers appreciated their efforts rather than focusing solely on correct answers. This finding aligns with Bandura's social cognitive theory, which highlights the importance of self-efficacy in influencing students' learning motivation and emotional responses (Bandura, 2021). Students with stronger self-efficacy are more likely to approach challenging tasks confidently and experience lower levels of academic anxiety.

Although the implementation of humanistic pedagogical strategies produced positive outcomes, the study also identified several challenges faced by teachers. One major

challenge involved limited teacher training regarding emotional and psychological aspects of mathematics learning. Some teachers admitted that they were unfamiliar with specific strategies for addressing students' anxiety and emotional difficulties. In addition, large classroom sizes and limited instructional time sometimes made it difficult for teachers to provide individualized emotional support for all students. These findings indicate that successful implementation of humanistic pedagogy requires institutional support, professional development programs, and greater awareness regarding students' emotional needs in mathematics education.

From a broader perspective, the findings demonstrate that reducing math anxiety cannot rely solely on curriculum improvement or cognitive instruction. Emotional support, classroom climate, and interpersonal relationships between teachers and students play equally important roles in shaping students' mathematical experiences. This finding supports Maslow's hierarchy of needs theory, which explains that students' psychological safety and emotional belongingness must be fulfilled before optimal learning can occur (Maslow, 2020). Students who feel accepted, respected, and emotionally secure are more likely to participate actively and develop positive learning attitudes.

The findings of this study also reveal an important research implication regarding elementary mathematics education in Indonesia. Current mathematics instruction often prioritizes academic achievement and examination performance while paying insufficient attention to students' emotional well-being. As a result, students may achieve procedural competence while simultaneously developing negative emotional attitudes toward mathematics. Humanistic pedagogical strategies provide an alternative approach capable of balancing cognitive achievement with emotional development. Therefore, integrating empathy, emotional support, collaborative interaction, and contextual learning into mathematics instruction may help create more inclusive and student-friendly learning environments.

Overall, this study confirms that humanistic pedagogical strategies can contribute significantly to reducing math anxiety among elementary school students. Through supportive teacher communication, collaborative learning, contextual instruction, and emotional reinforcement, students become more confident, engaged, and comfortable during mathematics learning activities. These findings suggest that humanistic pedagogy should be considered an essential component of elementary mathematics education, particularly in efforts to improve students' emotional experiences and long-term attitudes toward mathematics learning.

CONCLUSION

This study concludes that humanistic pedagogical strategies play an important role in reducing math anxiety among elementary school students during mathematics learning. The findings indicate that students' anxiety in mathematics is influenced not only by cognitive difficulties but also by emotional experiences, classroom climate, and teacher-student interactions. Humanistic pedagogical practices such as empathetic communication, collaborative learning, contextual instruction, positive reinforcement, and emotional support were found to create a more comfortable and psychologically safe learning environment. These strategies encouraged students to participate more actively, express their ideas confidently, and perceive mathematics as a meaningful and less intimidating subject.

The study also revealed that supportive teacher behavior significantly contributed to students' emotional well-being and self-confidence in mathematics learning. Students who received appreciation, guidance, and constructive feedback from teachers demonstrated lower levels of fear and hesitation during classroom activities. In addition, collaborative and contextual learning activities helped students reduce emotional pressure while improving engagement and interaction with peers. Nevertheless, several challenges remain, particularly limited teacher training related to emotional aspects of mathematics instruction and constraints in providing individualized support within large classrooms.

Overall, this study emphasizes that reducing math anxiety requires not only improvements in instructional content but also the integration of emotionally responsive and humanistic pedagogical approaches in elementary mathematics education. Therefore, teachers, schools, and policymakers should strengthen the implementation of student-centered and emotionally supportive learning practices to foster positive mathematical experiences and improve students' long-term attitudes toward mathematics.

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