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STUDENTS' PERCEPTIONS OF MATHEMATICS AS A "FRIGHTENING" SUBJECT

Andi Mulawakkan Firdaus[1], Herwandi [*2]

[1]Universitas Muhammadiyah Makassar
[2]Institut Teknologi dan Kesehatan Permata Ilmu Maros

** Korespondensi Penulis. E-mail: herwandi@itkpi.ac.id*

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ABSTRACT
This study aims to explore students' perceptions of mathematics as a "frightening" subject and to identify the factors influencing such perceptions. The research was conducted in senior high schools across Maros Regency, South Sulawesi, using a mixed-methods approach. Data were collected through a Likert-scale questionnaire to quantitatively measure students' perceptions, and semi-structured interviews with students and teachers to gather qualitative insights. The findings reveal that the majority of students hold negative perceptions of mathematics, characterized by anxiety, stress, and a lack of self-confidence in learning. Contributing factors include monotonous teaching methods, pressure from teachers and the school environment, and unpleasant learning experiences. Teachers also acknowledged challenges in changing students' perceptions due to curriculum demands and limited instructional time. This study recommends the implementation of more contextual, enjoyable, and student-centered teaching approaches to transform negative perceptions into positive ones. These findings provide valuable input for policymakers, educators, and curriculum developers in designing mathematics instruction that is more student-friendly and focused on meaningful learning experiences.

Introduction

Mathematics is one of the core subjects in the Indonesian education curriculum and is taught to students from primary to secondary levels. However, a considerable number of students hold negative perceptions of mathematics. The labeling of mathematics as a "frightening" or "difficult" subject has become a widespread phenomenon in various regions, including Maros Regency, South Sulawesi. This phenomenon warrants serious attention in the field of education, particularly with regard to how such perceptions are formed, the factors influencing them, and their impact on students' learning outcomes.

Previous studies have frequently associated mathematics with abstract symbols, rigid procedures, and a strong emphasis on obtaining correct answers (Firdaus & Herwandi, 2023). As a result, many students feel intimidated by the demand for accuracy, which leads them to develop anxiety or even phobia toward the subject. This condition is further exacerbated by learning approaches that lack contextualization and interactivity, as well as stereotypes from teachers or the surrounding environment that reinforce negative images of mathematics.

In Maros Regency, senior high schools, as the upper secondary education level, play a strategic role in shaping students' attitudes and interests toward mathematics, particularly as preparation for higher education. However, based on preliminary observations and informal interviews with several teachers and students, a tendency toward negative attitudes toward mathematics was identified. Many students expressed fear, stress, and even reluctance to attend mathematics classes. Such conditions inevitably affect academic performance, self-confidence, and future career choices.

This study is therefore important to conduct in order to explore in depth students' perceptions of mathematics in senior high schools throughout Maros Regency. Using both qualitative and quantitative approaches, the study aims to identify general patterns of students' perceptions, contributing factors, and potential solutions to overcome negative perceptions. The findings are expected to provide valuable input for teachers, schools, and other stakeholders in designing mathematics learning strategies that are more humane, contextual, and enjoyable.

Negative perceptions of mathematics are not a new phenomenon; however, if not addressed through appropriate approaches, they will continue to hinder the progress of mathematics education in Indonesia (Komariah et al., 2023). Consequently, a comprehensive mapping of factors such as teaching methods, teachers' attitudes, learning materials, and students' learning experiences both inside and outside the classroom is required (Rhadinda, 2021).

Moreover, students' perceptions of mathematics are strongly influenced by local social and cultural contexts (Supriadi, 2023). In Maros Regency, which is characterized by cultural diversity and varied socioeconomic backgrounds, it is essential to understand how these local characteristics shape students' perceptions of mathematics. Are there specific cultural factors that strengthen or weaken students' motivation to learn mathematics? Do parents, peers, or social expectations contribute to the formation of these perceptions?

One of the main challenges is how to build a positive image of mathematics among students without neglecting the complexity of concepts and competencies that must be mastered (Supadmi, 2024). It is necessary to identify approaches that position students as active subjects of learning rather than passive recipients of information. Technology-based learning innovations, realistic approaches, and the integration of real-life contexts may serve as promising alternative solutions (Udil et al., 2021).

In addition, teachers' competence and attitudes toward mathematics play a crucial role in shaping students' perceptions (Wullan et al., 2023). Teachers with strong pedagogical competence and the ability to establish positive emotional relationships with students are more likely to foster learning motivation and interest in mathematics (Herwandi & Habiba, 2023). Therefore, this study also highlights the extent to which teachers and their teaching styles influence students' perceptions.

Internal factors influencing students' perceptions include self-efficacy, or students' confidence in their ability to solve mathematical problems. Students who have experienced negative outcomes, such as repeated failures in examinations or consistently low grades, tend to develop the belief that they are "not suited" or "not capable" in mathematics. This lack of confidence hinders active participation in learning and creates a cycle of failure that is difficult to break (Oktavia et al., 2023).

Intrinsic motivation also plays an important role. Students who learn mathematics out of personal interest and curiosity tend to have more positive perceptions than those who learn solely due to parental pressure or grade requirements (Sari et al., 2022). Therefore, exploratory approaches that foster curiosity are essential to shift the learning paradigm from merely "pursuing grades" to "seeking meaning."

From the perspective of external factors, pressure from the social environment, such as peers, can influence students' perceptions. For instance, if a peer group commonly perceives mathematics as difficult and boring, this perception can spread and form a negative collective opinion (Yuliana et al., 2021). In addition, parents play a crucial role. Parents who unconsciously convey negative views, such as stating, "I was also not good at mathematics," may reinforce their children's lack of self-confidence.

School culture, classroom atmosphere, and the manner in which teachers provide feedback are also important variables. When teachers emphasize mistakes rather than students' thinking processes, students become more afraid of making errors and less willing to try. Furthermore, monotonous teaching styles, such as relying solely on lectures and repetitive exercises, make mathematics feel disconnected from students' real lives (Zahra, 2020).

It is also important to highlight differences in perceptions between male and female students toward mathematics. Several studies indicate that male students tend to be more confident in mathematics, whereas female students are more likely to experience anxiety and fear of making mistakes. Such gender stereotypes need to be addressed through equitable and inclusive teaching approaches (Toyiba et al., 2024).

As a solution-oriented effort, numerous innovative approaches have been developed to make mathematics learning more engaging and contextual (Sape, 2024). One example is the Realistic Mathematics Education (RME) approach, developed in the Netherlands and adopted in Indonesia, which encourages students to understand mathematics through real-life contexts. This approach can be used to build connections between mathematics and students' real-world experiences in Maros, such as local economic activities, culture, or natural phenomena.

The use of technology also represents a potential solution. Game-based learning applications, interactive videos, and online learning platforms can bridge the gap between conventional teaching methods and the learning needs of today's digital generation (Sape et al., 2024). Technology also enables teachers to personalize learning according to students' individual learning speeds and styles (Sape, 2025).

In the context of Maros Regency, synergy among schools, families, and local communities is essential to create an educational ecosystem that supports positive perceptions of mathematics. Activities such as mathematics competitions based on local culture, the introduction of inspirational figures in mathematics, or educational visits to relevant institutions can help instill the importance of mathematics in real life.

Finally, changing students' perceptions cannot be achieved in a short period of time. It requires sustained, reflective, and adaptive efforts involving all components of education (Tamba et al., 2023). Teachers need continuous professional development, students should be given space to express themselves and ask questions, and curricula must be continuously evaluated to remain relevant and meaningful (Prasetyo et al., 2023).

By understanding and addressing the factors that cause mathematics to be perceived as "frightening," it is hoped that a generation of learners will emerge who are not only capable of mastering mathematics but also appreciate and utilize it as a critical thinking tool to face life's challenges.

Method

This study employed a qualitative descriptive research design with a phenomenological approach. The research aimed to explore and understand students' perceptions of mathematics. A collective case study design was adopted by involving twelve (12) senior high schools as representatives of all senior high schools in Maros Regency. This design was chosen to obtain a more comprehensive picture of the variation in students' perceptions across different social, economic, and cultural backgrounds.

The research subjects were Grade X and Grade XI students from both public and private senior high schools located in Maros Regency, South Sulawesi. The selection of participants was conducted using purposive sampling, with consideration given to the diversity of students' academic backgrounds (high-achieving and low-achieving in mathematics), gender, and levels of interest in mathematics. A total of 50 student informants from 12 different schools participated in the study.

The primary research instrument was the researcher themself as a human instrument, supported by semi-structured interview guidelines for students and teachers, as well as a student perception questionnaire on mathematics. In-depth, semi-structured interviews were conducted with both students and teachers to explore their experiences and perceptions related to mathematics learning. The questionnaire was used to measure students' perceptions using a five-point Likert scale, ranging from strongly agree to strongly disagree, in response to statements related to mathematics.

Data were analyzed qualitatively through the following stages: data reduction, which involved filtering and selecting relevant data based on categories of perceptions, learning experiences, and students' emotional responses; data display, in which findings were organized into narratives, tables, and diagrams to facilitate interpretation; and conclusion drawing and verification, which involved identifying patterns of perceptions and contributing factors, followed by triangulation with observational data and teacher interview results to enhance validity. Questionnaire data were analyzed using descriptive quantitative techniques (percentages and mean scores) to support the qualitative findings.

Results and Discussion

1. Results of the Student Perception Questionnaire on Mathematics

The questionnaire was completed by 180 students from 12 senior high schools in Maros Regency. The summary of students' responses to several key statements in the questionnaire is presented in Table 1.

Table 1. Summary of Student Perception Questionnaire Results

No	Pernyataan	SS (%)	S (%)	N (%)	TS (%)	STS (%)	Skor Rata-rata
1	Saya merasa takut saat pelajaran matematika dimulai.	36	40	15	7	2	4,01
2	Matematika adalah pelajaran yang sulit dipahami.	42	38	12	6	2	4,12
3	Guru matematika membuat saya lebih memahami materi.	12	28	30	20	10	3,02
4	Saya merasa stres ketika ada tugas atau ujian matematika.	40	35	15	8	2	4,00
5	Saya merasa percaya diri saat mengerjakan soal matematika.	5	20	25	30	20	2,58

Based on Table 1, there is a significant tendency toward negative student perceptions of mathematics. The five main indicators used to measure these perceptions represent students' emotional, cognitive, and affective dimensions during their engagement with mathematics learning at school.

1. Fear of Mathematics as the Onset of Negative Perception

In response to the first statement, *"I feel afraid when the mathematics lesson begins,"* 76% of students indicated agreement or strong agreement. The mean score of 4.01 suggests that fear is a common experience among students prior to the start of mathematics lessons. This fear may stem from previous negative experiences, pressuring instructional methods, or excessively high performance expectations. Persistent and recurring fear can negatively affect students' mental readiness to absorb new material.

2. Mathematics Perceived as Difficult

The second statement addressed students' cognitive perceptions of mathematics as a difficult subject to understand. The high mean score (4.12) and the large proportion of students who agreed or strongly agreed (80%) indicate that most students perceive mathematics as an excessively demanding intellectual challenge. This finding reflects a gap between instructional methods and students' learning capacities. In addition, insufficient mastery of basic concepts from earlier educational levels also contributes significantly to this perception.

3. Perceptions of the Teacher's Role

The third statement reflects students' views of teachers' effectiveness in delivering mathematics instruction. Only 40% of students agreed or strongly agreed that mathematics teachers helped them understand the material, while 30% were neutral and another 30% disagreed. The relatively low mean score of 3.02 suggests that perceptions of teachers tend to be moderate or even unfavorable. This may be related to overly conventional teaching styles, a lack of contextual approaches, or limited empathetic interaction between teachers and students.

4. Academic Stress and Pressure

The fourth statement indicates that 75% of students experience stress when dealing with mathematics assignments or examinations. The mean score of 4.00 demonstrates that academic pressure in mathematics learning is perceived as quite high. Such stress may arise from various factors, including grade demands, limited time to complete tasks, and a tense classroom atmosphere. These conditions can significantly reduce students' performance due to sustained psychological pressure.

5. Low Self-Confidence

The results for the fifth statement are particularly striking. Only 25% of students agreed or strongly agreed that they felt confident when solving mathematics problems, while 50% reported a lack of confidence. The mean score of 2.58 indicates very low levels of student confidence in their mathematical abilities. This finding serves as a strong indicator of weak numeracy literacy and limited metacognitive skills in developing problem-solving strategies.

Correlational Analysis among Indicators

Overall, a linear relationship was identified among fear, perceived difficulty, stress, and low self-confidence. When students begin lessons with fear, they tend to develop beliefs that mathematics is inherently difficult. This perception leads to tension during problem-solving and examinations, which ultimately undermines their self-confidence. This cycle forms a vicious circle that is difficult to break without systematic pedagogical intervention.

Influence of Local Social and Cultural Context

In the context of Maros Regency, cultural values that emphasize politeness and respect for authority can sometimes hinder students from actively asking questions or expressing confusion in class. Students often remain silent when they do not understand the material, and teachers may not always recognize these signs. Furthermore, family economic and educational backgrounds also influence students' perceptions. Students from families with limited educational backgrounds or minimal study support at home are more vulnerable to academic anxiety.

2. Results of Student and Teacher Interviews

a. Student Interviews

Excerpt from Student 1:

"When it's time for math class… my heart starts racing. Sometimes I pretend to go to the school clinic just to leave the classroom. If I get asked and can't answer, I'm afraid of being laughed at."

This excerpt indicates that the student experiences social anxiety and psychological pressure in mathematics learning, highlighting the importance of creating a safe and supportive learning environment.

Excerpt from Student 2:

"I actually like mathematics, but sometimes the teacher explains too fast, so I can't really understand. Over time, I lose my motivation."

This response reveals a mismatch between instructional pace and students' learning speed, leading to a decline in interest despite an initial positive attitude toward mathematics.

Excerpt from Student 3:

"When I hear the bell for math class, my chest feels tight. It's like taking a national exam every time!"

This student describes an intense emotional reaction to mathematics, indicating symptoms of academic anxiety. Physical sensations such as chest tightness suggest that fear of mathematics manifests not only psychologically but also physiologically.

Excerpt from Student 4:

"I often don't understand the teacher's explanation, but I'm too embarrassed to ask. I'm afraid my friends will laugh at me and think I'm stupid."

Feelings of shame and fear of ridicule limit students' participation in learning, underscoring the importance of a psychologically safe classroom climate. The lack of courage to ask questions also affects conceptual understanding and reinforces the perception that mathematics is difficult.

Excerpt from Student 5:
"When I was in elementary school, I liked mathematics, but as I moved up to higher grades, it got more complicated and I became less motivated."

This shift from positive to negative perceptions as educational levels increase indicates that instructional approaches that fail to adapt to students' developmental stages can reduce learning motivation. The increasing complexity of material without adequate support contributed to declining interest.

Excerpt from Student 6:
"I understand better when the teacher gives examples related to daily life, like buying and selling or cooking."

This student appreciates contextual learning approaches, reinforcing the importance of ethnomathematics and problem-based learning in making mathematics more relevant and accessible.

Excerpt from Student 7:
"I once got a bad grade, and my parents scolded me. After that, I became even more afraid of mathematics."

This excerpt highlights the significant influence of emotional support from the family. Parental pressure or reprimands following poor mathematics performance can worsen students' perceptions, emphasizing the need for positive and supportive parental involvement.

Excerpt from Student 8:
"When the teacher is patient and smiles a lot, I feel more motivated to join the lesson, even though it's still difficult."

Students' positive responses to friendly and supportive teachers reinforce the importance of teachers' affective qualities in creating a comfortable learning environment. Even when the material is challenging, a pleasant teacher presence can enhance students' learning motivation.

b. Teacher Interview Excerpts

Excerpt from Teacher 1:
"I am aware that many students are afraid of mathematics, so I started using storytelling and humor to help them feel more relaxed at the beginning."

This excerpt indicates that the teacher attempts to create a non-threatening classroom atmosphere. It reflects pedagogical awareness of students' emotional conditions and highlights the importance of a more humanistic approach to reducing learning anxiety.

Excerpt from Teacher 2:
"Sometimes I feel that students become afraid because they are too focused on exams and grades, rather than on the learning process itself."

This statement suggests that learning approaches that are overly outcome-oriented (grades and examinations) may contribute to students' psychological pressure. The teacher demonstrates an understanding that learning should emphasize the process, not merely the final results.

Excerpt from Teacher 3:
"There are still many passive students. They remain silent even when they do not understand, which makes it difficult for me to assess their level of understanding."

This excerpt highlights the challenge teachers face in fostering student engagement. Such passivity is rooted in social anxiety and low self-confidence, requiring teachers to adopt more exploratory strategies to promote two-way interaction.

Excerpt from Teacher 4:
"We have actually participated in training programs, but implementation is difficult due to time constraints and a densely packed curriculum."

This response points to structural constraints within the education system that hinder pedagogical innovation. The teacher reveals the reality that, although they are aware of more effective methods, administrative demands and curriculum overload often become barriers.

Excerpt from Teacher 5:

"Students who come from families with an educational background tend to be more confident when learning mathematics."

This excerpt indicates that family environment influences students' perceptions. The teacher recognizes disparities in learning readiness based on students' socioeconomic and educational family backgrounds.

Excerpt from Teacher 6:

"I started using group discussion methods, and it turns out that some students became more active and less afraid of making mistakes."

This statement shows that the implementation of collaborative learning methods in mathematics can increase student participation. Working in groups provides students with a safer space to express ideas and reduces fear of making errors.

Synthesis of Interview Findings

Based on the analysis of interview excerpts from students and teachers across various senior high schools in Maros Regency, it can be concluded that students' perceptions of mathematics as a "frightening" subject result from a combination of emotional, cognitive, social-environmental, and instructional factors.

1. Emotional Aspects

Many students experience anxiety, fear, and even stress when facing mathematics lessons. These symptoms manifest both psychologically (lack of motivation, low self-esteem, fear of asking questions) and physiologically (nervousness, chest tightness). Emotional factors appear to be dominant in shaping negative perceptions.

2. Cognitive Aspects

The increasing level of difficulty of mathematical content at each educational stage leads students to lose self-confidence. Materials perceived as overly abstract and insufficiently contextual make it difficult for students to understand concepts, thereby reinforcing the image of mathematics as difficult and intimidating.

3. Affective and Relational Aspects

The relationship between students and teachers plays a critical role. Students tend to feel more comfortable learning mathematics when teachers are friendly, patient, and supportive. Conversely, rigid teacher attitudes, excessive focus on grades, or limited communication tend to intensify students' fear.

4. Influence of Social and Family Environment

Family support plays a vital role in shaping students' perceptions. Parental responses that emphasize punishment or pressure when children receive low grades can exacerbate learning-related trauma. In contrast, supportive learning environments that do not stigmatize mistakes help students develop more positive perceptions.

5. Instructional Methods

Conventional lecture-based methods with minimal interaction and contextualization contribute to student boredom and disengagement. Teachers who implement active strategies such as group discussions, contextual storytelling, or humor are better able to create a relaxed atmosphere and reduce students' fear of mathematics.

Conclusion

The findings of this study indicate that the majority of senior high school students in Maros Regency hold negative perceptions of mathematics, characterized by fear, anxiety, and low self-confidence when engaging with the subject. These perceptions are influenced by

multiple factors, including pressuring learning experiences, limited instructional variation, and learning orientations that focus excessively on final outcomes. Interviews with students and teachers reinforce these findings, revealing a mismatch between the instructional approaches employed and students' learning needs and styles. Therefore, more humanistic, contextual, and adaptive instructional approaches are required so that mathematics is no longer perceived as a "frightening" subject, but rather as a logical and enjoyable part of everyday life worth learning.

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