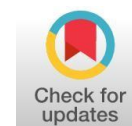


## The Relationship between Perceived Relevance of Mathematics Teaching Materials and Academic Anxiety of Students at SMAN 1 Sentolo



Rafli Ismail Putra <sup>1</sup>

<sup>1</sup> Jurusan Teknologi Pendidikan, Fakultas Ilmu Pendidikan, Universitas Negeri Yogyakarta. Jalan Colombo Yogyakarta No.1, Karang Malang, Caturtunggal, Kec. Depok, Kabupaten Sleman, Daerah Istimewa Yogyakarta 55281

Korespondensi Penulis. E-mail: [rafliismailputra@gmail.com](mailto:rafliismailputra@gmail.com), Telp: +6285213622896

### Abstrak

Kecemasan akademik dalam matematika sering menjadi penghambat prestasi siswa. Penelitian ini bertujuan untuk menganalisis hubungan antara persepsi relevansi materi ajar dengan tingkat kecemasan akademik siswa. Menggunakan pendekatan kuantitatif korelasional, penelitian ini melibatkan 100 siswa SMAN 1 Sentolo yang dipilih melalui teknik *simple random sampling*. Data dikumpulkan menggunakan Skala Persepsi Relevansi Materi dan Skala Kecemasan Akademik yang valid dan reliabel. Analisis data menggunakan korelasi *Pearson Product Moment*. Hasil penelitian menunjukkan bahwa mayoritas siswa memiliki persepsi relevansi pada kategori sedang (64%) dan tingkat kecemasan akademik juga sedang (55%). Hasil uji hipotesis menemukan hubungan negatif yang signifikan antara persepsi relevansi dengan kecemasan akademik ( $r = -0,542$ ;  $p < 0,05$ ). Persepsi relevansi memberikan sumbangan efektif sebesar 29,3% terhadap penurunan kecemasan. Temuan ini mengindikasikan bahwa semakin tinggi siswa memahami kegunaan materi matematika bagi kehidupan mereka, semakin rendah tingkat kecemasan yang dialami. Disarankan bagi pendidik untuk menerapkan pembelajaran kontekstual yang menekankan nilai guna (*utility value*) untuk membantu mereduksi kecemasan siswa.

Keyword: Kecemasan Akademik, Pembelajaran Matematika, Persepsi Relevansi, Siswa SMA

### Abstract

*Academic anxiety in mathematics often hinders student achievement. This study aims to analyze the relationship between students' perception of teaching material relevance and academic anxiety. Using a quantitative correlational design, the study involved 100 students from SMAN 1 Sentolo selected via simple random sampling. Data were collected using the Perception of Relevance Scale and Academic Anxiety Scale. Data analysis used Pearson Product Moment correlation. The results showed that the majority of students had medium perceived relevance (64%) and medium academic anxiety (55%). Hypothesis testing revealed a significant negative relationship between perceived relevance and academic anxiety ( $r = -0.542$ ;  $p < 0.05$ ). Perceived relevance contributed 29.3% to the reduction of anxiety. This finding implies that higher perceived relevance of mathematics materials correlates with lower anxiety levels in students. Educators are advised to implement contextual learning emphasizing utility value to help reduce student anxiety.*

Keyword: Academic Anxiety, Mathematics Learning, Perception of Relevance, Senior High School Students

## INTRODUCTION

Education plays a vital role in improving the quality of human resources, with mathematics serving as a fundamental pillar that fosters critical, creative, and logical thinking skills. Recognizing this crucial role, the government continuously strives to enhance the quality of national education. However, the ideal condition of mathematics learning in Indonesia remains far from expectations. Reports from the Programme for International Student Assessment (PISA) consistently place Indonesia at the lower rankings in mathematics competence, indicating systemic challenges in the educational landscape (OECD, 2019). One of the factors strongly suspected of contributing to this low achievement is the students' negative perception. The belief that mathematics is a difficult and abstract subject often triggers academic anxiety, a prevalent phenomenon proven to correlate negatively with student achievement and engagement (Ashcraft, 2002).

Academic anxiety, specifically math anxiety, operates as a significant barrier to cognitive performance. Students who experience anxiety tend to suffer from cognitive impediments such as mental blocks due to the disruption of working memory capacity (Ashcraft, 2002; Beilock, 2008). These intrusive thoughts and worries consume cognitive resources that should be utilized for problem-solving. Consequently, anxious students often develop avoidance attitudes toward the subject. On the other hand, educational psychology literature, particularly Expectancy-Value Theory, suggests that the perceived relevance of teaching materials is one of the strongest drivers of learning motivation (Wigfield & Eccles, 2000; Hulleman & Harackiewicz, 2009). When students are able to see the utility of a subject for their lives, their interest and willingness to learn increase significantly.

However, a substantial gap remains between this theory and the reality in the classroom. Many students fail to see the connection between abstract mathematical concepts and their practical applications, leading them to view mathematics as a discipline devoid of meaning outside the school environment. Although the phenomena of math anxiety and the importance of material relevance have been widely studied separately, a significant research gap exists at the intersection of the two. Existing literature presents ambiguous results regarding the direct relationship between perceived relevance and anxiety. Some studies suggest a positive relationship where high relevance triggers anxiety due to pressure, while others find a negative relationship where high relevance reduces anxiety through motivation.

Therefore, this research targets this gap by specifically examining the relationship between students' perception of the relevance of teaching materials and their level of academic anxiety within the context of senior high school (SMA) learning in Indonesia. This study aims to describe the levels of perceived relevance and academic anxiety, as well as to analyze the correlation between these two variables at SMAN 1 Sentolo. By clarifying this relationship in a specific cultural and demographic context, this research is expected to provide practical insights for educators to design more meaningful and less anxiety-inducing learning strategies.



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## METHOD

This research employs a quantitative approach with a correlational design. This design was chosen to investigate the relationship between students' perception of relevance and academic anxiety without manipulating the variables. The research was conducted at SMAN 1 Sentolo, Kulon Progo Regency, during the 2025/2026 academic year. The population in this study comprised all students from grades X, XI, and XII, totaling approximately 300 students. From this population, a sample of 100 students was selected as research subjects. The sampling technique used was simple random sampling. This technique was selected because the population was considered homogeneous in the context of receiving the same mathematics curriculum. The selection process involved using a computer-based random number generator to ensure every student had an equal chance of being selected.

Data collection was carried out using a survey method with two psychological scales utilizing a Likert scale format. The first instrument is the Perception of Relevance Scale (Variable X), which consists of 10 items designed to measure students' subjective assessment regarding the utility, meaningfulness, and importance of mathematics in their lives. The second instrument is the Academic Anxiety Scale (Variable Y), which also consists of 10 items adapted to measure cognitive, emotional, and physiological responses related to mathematics learning. The scoring ranged from 1 to 5 for each item.

Before being used for data collection, both instruments underwent validity and reliability testing to ensure the quality of the data. The validity test used the Pearson Product Moment correlation technique. The results showed that all items in both scales were valid, with correlation coefficients ( $r$ -count) greater than the  $r$ -table value of 0,196. The reliability test was conducted using the Cronbach's Alpha formula. The analysis yielded a reliability coefficient of 0,812 for the Perception of Relevance Scale and 0,789 for the Academic Anxiety Scale. Both values are above the minimum threshold of 0,60, indicating that the instruments are reliable and consistent for use in this study.

The data analysis technique used in this research consisted of descriptive statistics and inferential statistics. Descriptive analysis was performed to present the general profile of the data, including the mean, standard deviation, and frequency distribution of each variable. Before hypothesis testing, prerequisite tests were conducted, including the normality test using the Kolmogorov-Smirnov method and the linearity test to ensure the data met the assumptions for parametric statistics. Finally, hypothesis testing was performed using the Pearson Product Moment correlation analysis to determine the strength, direction, and significance of the relationship between the perception of relevance and academic anxiety. All statistical calculations were performed with the assistance of statistical software.

## RESULTS AND DISCUSSION

### Research Results

The data obtained from the field were analyzed descriptively to determine the profile of students' perception of relevance and their academic anxiety levels. To provide a clearer picture of the distribution, the data for both variables were categorized into three groups: High, Medium, and Low, based on the Mean and Standard Deviation (SD) values.

The frequency distribution for the variable of Perceived Relevance (Variable X) is presented in Table 1.

**Table 1. Frequency Distribution of Perceived Relevance**

Category	Score Interval	Frequency	Percentage
High	> 41,7	18	18%
Medium	31,3 – 41,7	64	64%
Low	< 31,3	18	18%
<b>Total</b>	-	100	100%

Based on Table 1, it can be seen that the majority of students at SMAN 1 Sentolo, totaling 64 students (64%), have a perception of relevance in the "Medium" category. This indicates that most students have sufficient awareness regarding the utility of mathematics, but this understanding may not yet be deeply internalized as a strong personal value. Only 18% of students are in the High category, showing that there is still room for improvement in emphasizing the importance of mathematics.

Furthermore, the data for Academic Anxiety (Variable Y) was also categorized. The distribution is shown in Table 2.

**Table 2. Frequency Distribution of Academic Anxiety**

Category	Score Interval	Frequency	Percentage
High	> 38,5	22	22%
Medium	26,3 – 38,5	55	55%
Low	< 26,3	23	23%
<b>Total</b>	-	100	100%

Referring to Table 2, the anxiety levels of students are also centered in the "Medium" category with 55 students (55%). However, a finding that requires attention is that 22% of students experience anxiety in the "High" category. This figure indicates that more than one-fifth of the students experience significant psychological pressure, which has the potential to hinder their academic performance. Conversely, 23% of students are in the Low anxiety category, meaning they can undergo mathematics learning with relative calmness.

To answer the research problem regarding the relationship between the two variables, hypothesis testing was conducted using the Pearson Product Moment correlation technique. The summary of the correlation test results is presented in Table 3.

**Table 3. Summary of Correlation Test Results**

Statistical Component	Result
Sample Size (N)	100
Correlation Coefficient (r)	-0,542
Significance Value (p)	0,000
Coefficient of Determination	29,3%
Relationship Direction	Negative

The analysis results in Table 3 show a correlation coefficient ( $r$ ) of -0.542 with a significance value ( $p$ ) of 0.000. Since the  $p$ -value is less than 0.05, the Null Hypothesis ( $H_0$ ) is rejected, and the Alternative Hypothesis ( $H_a$ ) is accepted. The negative sign (-) indicates an inverse relationship: the higher the students' perception of the relevance of teaching materials, the lower their academic anxiety. The coefficient of determination is 0.293, which means that the perception of relevance provides an effective contribution of 29.3% to the reduction of student anxiety, while the rest is influenced by other factors not examined in this study.

## Discussion

The main finding of this study confirms a significant negative correlation ( $r = -0.542$ ) between the perception of relevance and academic anxiety. This empirical evidence suggests that perceived relevance acts as a psychological buffer for students. When students perceive the material as "useful" or "relevant," their anxiety levels tend to decrease.

This phenomenon can be comprehensively explained through the Cognitive Appraisal Theory proposed by Lazarus and Folkman (1984). This theory posits that emotions, including anxiety, arise not from the event itself, but from how individuals appraise the event. When a student faces a difficult mathematics problem, their brain performs a rapid appraisal. If the student feels the material is useless, difficult, and boring, they are likely to appraise the problem as a "Threat" to their grades or self-esteem. This threat appraisal triggers a stress response and anxiety.

Conversely, when students have a high perception of relevance for example, they know that statistics material is useful for analyzing social media data they enjoy their cognitive appraisal shifts. The difficult problem is no longer seen solely as a threat, but as a meaningful "Challenge". This sense of meaningfulness provides additional motivation and, more importantly, a sense of control. The shift from a threat appraisal to a challenge appraisal effectively reduces the anxiety response.

This finding aligns with experimental research by Hulleman and Harackiewicz (2009), which found that simple interventions to help students see the relevance of science materials could increase interest and performance while lowering tension. This study proves that a similar mechanism applies in the context of mathematics learning in Indonesia. The contribution of 29.3% suggests that nearly one-third of the variance in student anxiety can be explained by how well they understand the value of the material.

The implication for mathematics instruction is significant. Teachers should move beyond merely teaching procedural skills (formulas and calculations) and allocate time to explain the "Big Picture" or utility value of the material. Contextual Teaching and Learning (CTL) strategies, which connect abstract concepts to real-world phenomena close to the students' lives, are highly recommended. When students can bridge the gap between formulas on the whiteboard and reality outside the classroom, their perception of relevance increases, which in turn serves as a protective factor against debilitating academic anxiety.

## CONCLUSION

Based on the data analysis and discussion, three main conclusions can be drawn. First, the level of students' perception regarding the relevance of mathematics teaching materials at SMAN 1 Sentolo is predominantly in the medium category (64%). This suggests that while students acknowledge the utility of mathematics, they have not fully internalized it as a personal value. Second, the level of academic anxiety among students is also largely in the medium category (55%), although a significant portion (22%) experiences high anxiety. Third, there is a significant negative relationship between the perception of relevance and academic anxiety. The perception of relevance contributes 29.3% to the reduction of anxiety. This implies that enhancing students' understanding of the utility value of mathematics can serve as an effective strategy to mitigate academic anxiety. Future research is recommended to explore experimental interventions to further validate this relationship.

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