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Research Paper

A Qualitative Study of Students' Perceptions of Math Anxiety, Mathematical Aptitude, and Happiness in Real-World Mathematics Applications

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ABSTRACT

The present study focuses on exploring students' perceptions of mathematics anxiety, mathematical aptitude, and their level of happiness while learning mathematics, particularly in relation to real-world applications. Mathematics is an essential subject that plays a significant role in both academic achievement and everyday life. However, many students develop fear and anxiety toward mathematics, which negatively affects their confidence, interest, and performance. The study adopts a qualitative research approach and is based on data collected from a sample of 20 students. Various tools such as a mathematics test, interview schedule, and observation method were used to gather detailed information about students' experiences, attitudes, and behaviours toward mathematics. The mathematics test was used to assess the level of mathematical aptitude, while interviews helped in understanding students' feelings of anxiety, confidence, and happiness. Observation provided insights into students' participation, behaviour, and engagement during mathematical activities. The findings of the study reveal that students who experience high levels of mathematics anxiety tend to show low performance, hesitation, lack of confidence, and avoidance behaviour. On the other hand, students with low anxiety demonstrate higher mathematical aptitude, better conceptual understanding, active participation, and positive attitudes toward mathematics. The study also indicates that emotional factors such as happiness and satisfaction play a crucial role in enhancing students' learning outcomes. Furthermore, the study highlights the importance of real-world application of mathematics. Students who are able to relate mathematical concepts to daily life situations show greater interest, motivation, and understanding. Such students are more confident and engaged in learning activities compared to those who do not see the practical relevance of mathematics. In conclusion, the study emphasizes that mathematics learning is influenced not only by cognitive abilities but also by emotional and environmental factors. Reducing mathematics anxiety, promoting positive learning experiences, and integrating real-life applications into teaching can significantly improve students' performance and attitudes toward mathematics. The findings of this study provide useful insights for teachers, educators, and curriculum planners to develop effective teaching strategies that support students' overall mathematical development.

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Mathematics is not only a subject taught in schools but also an essential part of everyday life. It helps individuals in developing logical reasoning, analytical thinking, and decision-making skills. From simple daily activities like counting money, measuring ingredients, and managing time to complex scientific and technological developments, mathematics plays a crucial role everywhere. However, despite its importance, many students develop a negative attitude toward mathematics. One of the major reasons behind this is mathematics anxiety, which is a feeling of fear, tension, or nervousness while dealing with mathematical tasks. This anxiety can begin at an early stage and may continue throughout a student's academic life if not addressed properly. Students who experience mathematics anxiety often believe that mathematics is difficult and beyond their ability. This belief reduces their confidence and motivation, which ultimately affects their academic performance. On the other hand, students who feel confident and comfortable with mathematics tend to perform better and show greater interest in the subject. Another important factor is mathematical aptitude, which refers to the natural ability of a student to understand mathematical concepts and solve problems. It varies from student to student and is influenced by teaching methods, practice, and exposure.

In addition, happiness and emotional satisfaction play a significant role in learning mathematics. When students enjoy solving problems and feel a sense of achievement, they develop a positive attitude toward the subject. This positive attitude encourages them to participate actively and learn more effectively. Moreover, connecting mathematics to real-world situations makes learning more meaningful. When students understand how mathematics is used in daily life, they are able to relate to the subject better, which reduces anxiety and increases interest.

Thus, this study focuses on understanding how mathematics anxiety, aptitude, happiness, and real-life application are interconnected.

Objectives of the Study

1. To examine students' perceptions and experiences related to mathematics anxiety in the learning process.
2. To analyse the level of mathematical aptitude among students based on their performance in mathematics tasks.
3. To explore students' feelings of happiness, interest, and emotional engagement while learning mathematics.

REVIEW OF RELATED LITERATURE

A study by **Sujatha. S, Vinayakan. K, (2023)** conducted research on **Linking Math with Real-World Applications.** The integration of mathematics with real-world applications enhances student engagement and deepens understanding by connecting abstract concepts to everyday life and professional contexts. This review highlights practical teaching approaches such as Problem-Based Learning (PBL), Project-Based Learning, contextualized instruction, interdisciplinary teaching, and technology integration, all of which promote active learning, critical thinking, and problem-solving skills. Grounded in theories like constructivism, situated learning, and inquiry-based learning, real-world integration helps students build meaningful connections between mathematical concepts and practical situations. Although challenges such as curriculum limitations and the need for teacher training exist,

incorporating real-life applications in math education has been shown to improve motivation, understanding, and long-term academic success while preparing students for future careers and modern societal demands.

A study by **Tartaro, Daniella M. (2023)** conducted research on the **Math Anxiety Research Paper.** This paper presents a clear and thoughtful review of math anxiety and its effects on students' academic performance and emotional well-being. It explains that feelings of fear, stress, and nervousness toward mathematics can lower students' confidence, reduce their motivation, and negatively affect their learning outcomes. When students feel anxious, they may struggle to concentrate and participate actively in class, which can lead to poor performance and a negative attitude toward the subject. The paper emphasizes the importance of early identification and intervention to prevent math anxiety from becoming a long-term problem. It highlights the need for a supportive and encouraging classroom environment where students feel safe to ask questions and learn from their mistakes. The role of parents and teachers working together is also discussed as an important factor in reducing anxiety and building positive learning experiences. By offering practical, student-centered teaching strategies and drawing from personal experience as a third-grade teacher, the review becomes both informative and relatable, providing useful insights for improving mathematics education.

This research investigates how anxiety impacts mathematical performance and how students' beliefs about math influence their experiences and engagement with the subject. Numerous studies highlight the negative effects of math anxiety on students' performance, motivation, and academic choices, potentially hindering their overall success in STEM fields. Longitudinal Studies Longitudinal research is necessary to track the development of math anxiety over time and understand its long-term effects on students' academic and career paths. Diverse Populations Further research is needed to explore the experiences of students from diverse backgrounds and to identify potential cultural and contextual factors that contribute to math anxiety. It also concluded that the literature on mathematical aptitude, self-efficacy, and motivation, as well as the growing body of research on the role of emotions in learning and problem-solving. This study investigated the specific context of real-world math applications and how students perceive the relevance of math in their lives.

RESEARCH METHODOLOGY

Research Design

This study is based on a qualitative research approach, which helps in understanding students' experiences, feelings, and behaviours in depth.

Sample

The sample consists of 20 students (respondents) selected for the study.

Tools Used

1. Mathematics Test – to measure aptitude
2. Interview Schedule – to understand students' feelings, anxiety, and experiences
3. Observation Method – to study behaviour, participation, and emotional responses

Procedure

The researcher conducted the mathematics test, followed by interviews and classroom observations. The collected data were carefully analysed and interpreted to identify patterns and relationships.

RESULTS AND INTERPRETATION

Mathematics Anxiety and Its Impact

The findings of the study clearly indicate that mathematics anxiety is one of the most important factors affecting students' performance. Students who reported high levels of anxiety showed signs of fear and hesitation while solving problems. They often avoided participating in class activities and lacked confidence in their answers.

These students also showed negative thinking patterns such as:

- "I cannot do mathematics"
- "Mathematics is too difficult"

Such thoughts reduce their ability to concentrate and solve problems effectively.

In contrast, students with low anxiety approached mathematics with confidence. They were willing to try different methods, learn from mistakes, and actively engage in classroom discussions.

This shows that reducing anxiety can significantly improve students' learning outcomes.

Mathematical Aptitude and Learning Ability

Mathematical aptitude plays a key role in determining how well a student can understand and apply mathematical concepts. The study reveals that students with higher aptitude not only scored well but also demonstrated better reasoning and logical thinking.

These students:

- Solved problems step by step
- Used different strategies
- Checked their answers carefully

On the other hand, students with low aptitude faced difficulty even in basic calculations. They required more guidance and practice to understand concepts.

This suggests that teachers should focus on developing students' aptitude through practice, activity-based learning, and conceptual teaching.

Happiness and Emotional Engagement

Happiness is an important but often ignored factor in education. The study shows that students who feel happy while learning mathematics are more likely to perform better.

Happy students:

- Show interest in solving problems
- Participate actively
- Feel motivated to learn

They experience a sense of achievement after solving a problem, which increases their confidence.

In contrast, students who feel stressed or bored lose interest and avoid mathematics. This creates a negative cycle where lack of interest leads to poor performance, and poor performance increases anxiety.

Therefore, it is important to create a positive and enjoyable learning environment**.**

Real-Life Application of Mathematics

One of the most important findings of this study is the role of real-life application in learning mathematics. Students who could connect mathematical concepts to daily life showed better understanding and interest.

For example:

- Calculating expenses while shopping
- Measuring ingredients while cooking
- Managing time and schedules

These real-life examples make mathematics more meaningful and less abstract.

Students who lacked such experiences found mathematics difficult and less interesting. They were unable to understand the practical importance of the subject.

This highlights the need for activity-based and experiential learning methods in teaching mathematics.

DISCUSSION

The results of this study clearly show that mathematics learning is influenced by both cognitive and emotional factors. While aptitude determines a student's ability, emotions such as anxiety and happiness influence how effectively that ability is used. Mathematics anxiety acts as a barrier that prevents students from performing to their full potential. Even students with good aptitude may perform poorly if they feel anxious.

Therefore, teachers should focus on:

- Encouraging students
- Avoiding negative criticism
- Creating a supportive environment

In addition, teaching should include:

- Real-life examples
- Group activities
- Interactive methods

Such strategies will help students develop confidence and reduce fear.

CONCLUSION

The study concludes that mathematics anxiety, aptitude, happiness, and real-life application are closely interconnected. A student's performance in mathematics is not only determined by intelligence but also by emotional and environmental factors. Students who feel confident and happy are more likely to succeed, while those who experience anxiety tend to struggle. Therefore, reducing anxiety and promoting positive attitudes toward mathematics is essential. The study also emphasizes that connecting mathematics to real-life situations can make learning more effective and enjoyable.

Thus, the overall success in mathematics depends on a combination of:

- Strong conceptual understanding
- Positive emotional experiences
- Practical application of knowledge

Future Recommendations

- Future studies should include a larger sample size for better results.
- Research can be conducted on different age groups to understand changes over time.

- Use of both qualitative and quantitative methods is recommended for more accurate findings.
- More focus should be given to innovative teaching methods to reduce mathematics anxiety.
- Mathematics should be connected with real-life applications to increase interest and understanding.
- Future research can study the role of teachers and classroom environment in students' learning.
- Development of programs to reduce math anxiety should be encouraged.

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Conflict of Interest

The author(s) declared no conflict of interest.

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