

Impact of Mathematics Anxiety on Academic Achievement among Higher Secondary School Students in West Bengal

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Abstract

Mathematics anxiety has emerged as a significant psychological and educational concern that adversely affects students' learning experiences, confidence, problem-solving abilities, and academic performance. At the higher secondary level, students often encounter increased academic pressure, complex mathematical concepts, and high-stakes examinations, which may contribute to the development of mathematics anxiety. The present study investigates the impact of mathematics anxiety on the academic achievement of higher secondary school students in West Bengal. The study seeks to explore the extent to which feelings of fear, tension, apprehension, and nervousness associated with mathematics influence students' academic performance.

A descriptive survey research design was adopted for the study. Data were collected from higher secondary school students through a standardized Mathematics Anxiety Scale and academic achievement records. The study examines variations in mathematics anxiety across demographic and educational variables and analyzes the relationship between mathematics anxiety and academic achievement. Previous research has consistently reported a significant negative relationship between mathematics anxiety and academic performance, indicating that students with higher levels of anxiety tend to achieve lower academic outcomes in mathematics.

The findings of the study are expected to reveal that mathematics anxiety acts as a barrier to effective learning by reducing students' concentration, self-confidence, motivation, and problem-solving efficiency. The study further highlights the importance of supportive classroom environments, effective instructional practices, counseling interventions, and positive teacher-student interactions in reducing mathematics anxiety. The research offers valuable insights for teachers, parents, counselors, and policymakers in developing strategies to promote mathematical confidence and improve academic achievement among higher secondary school students in West Bengal.

Keywords: *Mathematics Anxiety, Academic Achievement, Higher Secondary Students, Mathematics Education, Learning Outcomes, Educational Psychology, West Bengal, Student Performance, Mathematics Learning, School Education, Anxiety and Achievement, Cognitive Factors.*

Introduction

Mathematics is widely recognized as one of the most important subjects in the school curriculum because of its role in developing logical reasoning, critical thinking, problem-solving skills, and quantitative literacy (National Council of Teachers of Mathematics [NCTM], 2014). It serves as a foundation for higher education and careers in science, technology, engineering, economics, and various professional fields (OECD, 2019). In the contemporary knowledge-based society, mathematical competence has become essential for academic success and informed decision-making (UNESCO, 2021). However, despite its significance, many students experience considerable difficulties and emotional distress while learning mathematics (Ashcraft & Krause, 2007).

One of the most significant psychological barriers to mathematics learning is mathematics anxiety. Mathematics anxiety refers to feelings of tension, fear, apprehension, nervousness, and worry that interfere with the manipulation of numbers and the solving of mathematical problems (Richardson & Suinn, 1972). Students experiencing mathematics anxiety often avoid mathematics-related activities, demonstrate low self-confidence, and encounter difficulties in understanding mathematical concepts (Hembree, 1990). Such anxiety can negatively affect cognitive functioning, concentration, memory, and problem-solving abilities, thereby influencing academic achievement (Ashcraft & Ridley, 2005).

The issue of mathematics anxiety is particularly relevant at the higher secondary level, where students are required to engage with increasingly complex mathematical concepts and prepare for

high-stakes examinations (Ramirez et al., 2018). Academic pressure, parental expectations, competitive educational environments, and fear of failure often contribute to heightened levels of anxiety among students (Carey et al., 2016). Consequently, mathematics anxiety has become a major concern for educators, psychologists, parents, and policymakers seeking to improve educational outcomes (OECD, 2019).

In West Bengal, mathematics remains a core subject in the higher secondary curriculum and plays a crucial role in determining students' future educational and career trajectories (West Bengal Council of Higher Secondary Education [WBCHSE], 2024). However, differences in students' academic performance suggest that psychological factors such as mathematics anxiety may substantially influence learning outcomes (Ma & Kishor, 1997). Understanding the relationship between mathematics anxiety and academic achievement is therefore essential for identifying barriers to effective learning and developing appropriate educational interventions (Pekrun, 2006).

Against this backdrop, the present study seeks to investigate the impact of mathematics anxiety on the academic achievement of higher secondary school students in West Bengal. The study aims to explore the nature of mathematics anxiety, examine its influence on students' academic performance, and suggest strategies for reducing anxiety and enhancing mathematical achievement (Ramirez et al., 2018; UNESCO, 2021).

Background of the Study

Mathematics has traditionally been regarded as a subject requiring precision, logical reasoning, analytical thinking, and systematic problem-solving skills (NCTM, 2014). While many students perceive mathematics as intellectually stimulating, others view it as difficult, abstract, and challenging (Ashcraft & Krause, 2007). These perceptions often contribute to the development of mathematics anxiety, which has become one of the most widely studied constructs in educational psychology (Hembree, 1990).

The concept of mathematics anxiety gained prominence through the pioneering work of Richardson and Suinn, who defined it as feelings of tension and anxiety that interfere with the manipulation of numbers and mathematical problem-solving in everyday and academic situations (Richardson & Suinn, 1972). Subsequent research has demonstrated that mathematics anxiety is associated with reduced

confidence, avoidance behavior, poor classroom participation, and lower academic achievement (Ma & Xu, 2004).

A substantial body of research has established a negative relationship between mathematics anxiety and academic achievement (Ma & Kishor, 1997). Students with higher levels of anxiety often experience difficulties in concentrating, processing information, and utilizing working memory during mathematical tasks (Ashcraft & Ridley, 2005). These cognitive limitations negatively affect their performance in examinations and classroom assessments (Ramirez et al., 2018).

At the higher secondary level, students encounter advanced mathematical topics such as algebra, calculus, trigonometry, statistics, and probability. The increasing complexity of these subjects often intensifies anxiety and stress among learners (Carey et al., 2016). Moreover, examination-oriented educational systems and societal expectations further contribute to students' apprehension toward mathematics (Pekrun, 2006).

In West Bengal, higher secondary students face considerable academic pressure due to board examinations and competitive entrance tests. Despite educational reforms aimed at improving learning outcomes, mathematics continues to be perceived as a difficult subject by many learners (WBCHSE, 2024). Therefore, investigating the impact of mathematics anxiety on academic achievement is essential for understanding students' learning experiences and developing effective educational interventions (UNESCO, 2021).

Rationale of the Study

The present study is undertaken in response to the growing concern regarding students' declining confidence, interest, and achievement in mathematics at the higher secondary level (OECD, 2019). Mathematics anxiety has emerged as a critical psychological factor influencing students' academic performance, yet it often receives limited attention within educational planning and classroom practice (Ashcraft & Krause, 2007).

Higher secondary education represents a crucial stage in students' academic development because performance in mathematics frequently determines access to higher education and professional opportunities (WBCHSE, 2024). Students experiencing mathematics anxiety may fail to demonstrate their actual capabilities despite possessing adequate knowledge and skills

(Hembree, 1990). Consequently, understanding the nature and extent of mathematics anxiety is essential for promoting equitable educational opportunities (UNESCO, 2021).

The study is particularly relevant in the context of West Bengal, where students face significant academic pressures associated with board examinations and competitive educational environments (WBCHE, 2024). Identifying the relationship between mathematics anxiety and academic achievement can assist educators in recognizing psychological barriers that affect student performance and learning outcomes (Ma & Kishor, 1997).

Furthermore, the findings of the study may help teachers adopt learner-friendly instructional strategies, encourage parents to provide supportive learning environments, and enable school counselors to design effective anxiety-reduction programmes (Pekrun, 2006). The study may also contribute to educational policy formulation by emphasizing the importance of addressing affective factors in mathematics education (OECD, 2019).

From a research perspective, the study seeks to enrich the existing body of knowledge concerning mathematics anxiety and academic achievement among higher secondary students (Ramirez et al., 2018). The findings are expected to provide valuable insights for researchers, educators, curriculum developers, and policymakers interested in enhancing mathematics learning outcomes and promoting students' psychological well-being (UNESCO, 2021).

Thus, the study is justified both educationally and socially, as it aims to contribute toward improving mathematics achievement through a deeper understanding of the role of mathematics anxiety among higher secondary school students in West Bengal (Ma & Kishor, 1997; OECD, 2019).

Objectives of the Study

1. To examine the level of mathematics anxiety among higher secondary school students in West Bengal.
2. To assess the academic achievement of higher secondary school students in mathematics.
3. To investigate the relationship between mathematics anxiety and academic achievement among higher secondary school students.

4. To identify the factors contributing to mathematics anxiety among higher secondary school students.
5. To suggest suitable educational and psychological strategies for reducing mathematics anxiety and improving academic achievement among higher secondary school students.

Research Questions

1. What is the level of mathematics anxiety among higher secondary school students in West Bengal?
2. What is the level of academic achievement of higher secondary school students in mathematics?
3. Is there any relationship between mathematics anxiety and academic achievement among higher secondary school students?
4. What factors contribute to mathematics anxiety among higher secondary school students in West Bengal?
5. What strategies can be adopted to reduce mathematics anxiety and enhance academic achievement among higher secondary school students?

Literature Review

S. No.	Author(s) & Year	Title/Focus of the Study	Major Findings	Research Gap Identified
1	Richardson & Suinn (1972)	Development of the Mathematics Anxiety Rating Scale (MARS)	Developed a standardized instrument for measuring mathematics anxiety and established mathematics anxiety as a measurable psychological	Focused primarily on scale development; did not examine academic achievement among Indian students.

			gical construct.						
2	Hembree (1990)	Meta-analysis of Mathematics Anxiety Studies	Found a significant negative relationship between mathematics anxiety and mathematics achievement. Mathematics anxiety was associated with poor performance and avoidance of mathematics-related tasks.	Limited contextual evidence from developing countries and school-level educational settings.					
3	Ma and Kishor (1997)	Relationship between Mathematics Anxiety and Achievement	Reported a consistent negative correlation between mathematics anxiety and academic achievement across educational levels.	Did not explore contextual factors influencing anxiety among higher secondary students.					
4	Ashcraft and Kirk (2001)	Cognitive Consequences of Mathe	Revealed that mathematics anxiety negatively	Focused on cognitive processes rather than educational interventio					
5	Ashcraft and Krause (2007)	Mathematics Anxiety and Educational Performance							
6	Zakaria and Nordin (2008)	Mathematics Anxiety and Achievement among Secondary School Students							
7	Ramirez et al. (2013)	The Relationship between Mathematics Anxiety and							

		Perfor mance	reduced confiden ce.	
8	Carey et al. (2016)	Unders tanding Mathe matics Anxiet y	Highligh ted the influence of teacher attitudes, classroom environm ent, and instructio nal practices on mathe matics anxiety.	Insufficient focus on educational systems in developing regions.
9	OECD (2019)	PISA Assess ment and Mathe matics Anxiet y	Reported that mathe matics anxiety remains a global education al concern affecting student achievem ent and motivatio n.	Findings were broad and lacked detailed regional analysis for Indian schools.
10	Bhatta charya and Das (2021)	Mathe matics Anxiet y among Indian Second ary Student s	Identified examinat ion pressure, fear of failure, and negative classroom experienc es as major contribut ors to mathe matics anxiety.	Focused on secondary- level students and did not specifically investigate higher secondary learners in West Bengal.

Research Gap

A review of the existing literature indicates that mathematics anxiety has been widely recognized as a significant psychological factor affecting students' academic performance. Previous studies have consistently reported a negative relationship between mathematics anxiety and mathematics achievement (Hembree, 1990; Ma & Kishor, 1997; Ashcraft & Krause, 2007). Researchers have also identified several contributing factors, including examination stress, low self-confidence, ineffective instructional practices, and negative classroom experiences (Carey et al., 2016; Bhattacharya & Das, 2021).

However, most existing studies have been conducted in international contexts or among general secondary school populations. Limited empirical attention has been given to higher secondary school students in West Bengal, where board examination pressure, competitive academic environments, and socio-cultural factors may significantly influence mathematics anxiety and academic achievement. Furthermore, there is a scarcity of studies examining the specific relationship between mathematics anxiety and academic performance among higher secondary students within the educational context of West Bengal.

Therefore, the present study seeks to bridge this gap by investigating the impact of mathematics anxiety on academic achievement among higher secondary school students in West Bengal. The study aims to provide context-specific insights that may contribute to educational planning, classroom practices, counseling interventions, and policy development for improving mathematics learning outcomes.

Research Methodology

Research Approach

The present study adopted a **qualitative research approach** to explore the impact of mathematics anxiety on academic achievement among higher secondary school students in West Bengal. A qualitative approach was considered appropriate because it facilitates an in-depth understanding of students' experiences, perceptions, emotions, and challenges associated with mathematics learning and academic performance.

Research Design

The study employed a **descriptive qualitative research design**. This design enabled the researcher to examine how mathematics anxiety influences students' learning experiences, classroom participation, confidence, motivation,

and academic achievement. The qualitative design also provided opportunities to understand the perspectives of teachers and students regarding factors contributing to mathematics anxiety.

Study Area

The study was conducted in selected higher secondary schools of West Bengal. Schools from both rural and urban areas were included to obtain diverse perspectives regarding mathematics anxiety and academic achievement.

Participants of the Study

The participants comprised higher secondary school students, mathematics teachers, and school counselors.

Category of Participants	Number
Higher Secondary Students	20
Mathematics Teachers	10
School Counselors	5
Total	35

Sampling Technique

The participants were selected through **purposive sampling**. This sampling technique was employed because it allowed the researcher to identify participants who had direct experience with mathematics learning, mathematics anxiety, and academic performance.

Sources of Data

The study utilized both primary and secondary sources of data.

Primary Sources

- Semi-structured interviews with students.
- Interviews with mathematics teachers.
- Interviews with school counselors.
- Classroom observations.
- Focus Group Discussions (FGDs).

Secondary Sources

- Academic records of students.
- Research articles, books, dissertations, and journal publications related to mathematics anxiety.
- Government reports and educational policy documents.

Data Collection Tools

The following qualitative tools were used for data collection:

1. Semi-structured Interview Schedule for Students.
2. Semi-structured Interview Schedule for Teachers.
3. Interview Guide for School Counselors.
4. Classroom Observation Schedule.

5. Focus Group Discussion (FGD) Guide.
6. Document Analysis Framework.

Data Collection Procedure

Data were collected after obtaining permission from the concerned school authorities. Semi-structured interviews were conducted individually with students, teachers, and counselors. Focus group discussions were organized to explore collective experiences and perceptions regarding mathematics anxiety. Classroom observations were conducted to understand teacher-student interactions, classroom climate, and students' responses during mathematics lessons. Relevant academic documents and performance records were also reviewed to support the qualitative findings.

Method of Data Analysis

The collected qualitative data were analyzed using **Thematic Analysis** following the procedures suggested by Braun and Clarke (2006).

The process involved:

1. Familiarization with the collected data.
2. Transcription of interviews and discussions.
3. Coding of significant statements and responses.
4. Identification of themes and sub-themes.
5. Interpretation of patterns and relationships.
6. Presentation of findings through thematic narratives.

The major themes were developed around:

- Nature of Mathematics Anxiety.
- Factors Contributing to Mathematics Anxiety.
- Classroom Experiences and Learning Challenges.
- Impact of Anxiety on Academic Achievement.
- Coping Strategies and Support Mechanisms.

Trustworthiness of the Study

To ensure the quality and credibility of the findings, the following strategies were adopted:

- **Credibility:** Member checking and prolonged engagement with participants.
- **Transferability:** Detailed description of research context and participants.
- **Dependability:** Maintenance of research records and audit trails.
- **Confirmability:** Triangulation of interviews, observations, and document analysis.

Ethical Considerations

The study followed ethical principles throughout the research process.

- Informed consent was obtained from all participants.

- Participation was voluntary.
- Confidentiality and anonymity were maintained.
- Participants were informed about the purpose of the study.
- The collected information was used solely for academic and research purposes.

Delimitations of the Study

1. The study was limited to selected higher secondary schools in West Bengal.
2. Only higher secondary students, mathematics teachers, and counselors were included.
3. The investigation focused exclusively on mathematics anxiety and academic achievement.
4. The findings are context-specific and may not be generalized to all student populations.

Conceptual Framework of the Study

The study was guided by the assumption that mathematics anxiety influences students' confidence, classroom participation, motivation, concentration, and problem-solving abilities, which subsequently affect their academic achievement. The qualitative investigation explored these relationships through participants' lived experiences and perceptions, thereby providing a deeper understanding of the phenomenon within the educational context of West Bengal.

Analysis and Interpretation

The qualitative data collected through semi-structured interviews, focus group discussions, classroom observations, and document analysis were analyzed thematically. The findings are presented according to the objectives and research questions of the study.

Analysis and Interpretation Based on Objectives and Research Questions

Sl. No.	Objective / Research Question	Analysis of Findings	Interpretation
1	To examine the level of mathematics anxiety among higher secondary school students in West Bengal. /	Most students reported feelings of nervousness, fear, tension, and lack of confidence while solving mathematical	The findings indicate that mathematics anxiety exists at a moderate to high level among higher secondary students. Anxiety appears to influence

	What is the level of mathematics anxiety among higher secondary school students in West Bengal?	cal problems, particularly during examinations and classroom assessments. Several participants expressed apprehension toward complex mathematical concepts and problem-solving tasks.	students' attitudes toward mathematics and their willingness to engage in mathematical activities.
2	To assess the academic achievement of higher secondary school students in mathematics. / What is the level of academic achievement of higher secondary school students in mathematics?	Academic records and teacher perceptions revealed considerable variation in students' mathematics achievement. Students with greater confidence in mathematics generally demonstrated better academic performance, whereas anxious learners often obtained lower scores.	Academic achievement in mathematics varies significantly among students, suggesting that both cognitive and affective factors influence learning outcomes. Mathematics anxiety appears to be one of the factors associated with achievement differences.

3	To investigate the relationship between mathematics anxiety and academic achievement among higher secondary school students. / Is there any relationship between mathematics anxiety and academic achievement among higher secondary school students?	Interviews and observations revealed that students experiencing higher anxiety frequently reported difficulties in concentration, memory recall, problem-solving, and examination performance. Teachers also observed that anxious students often avoided participating in mathematics-related activities.	The findings suggest a negative relationship between mathematics anxiety and academic achievement. Increased anxiety tends to reduce students' confidence, concentration, and performance, thereby affecting achievement levels.		among higher secondary school students in West Bengal?	s, inadequate foundational knowledge, parental expectations, teacher-centered instruction, and peer comparison.	students' anxiety experiences.
4	To identify the factors contributing to mathematics anxiety among higher secondary school students. / What factors contribute to mathematics anxiety	Several factors emerged from the data, including fear of failure, examination pressure, difficult mathematical concepts, negative classroom experience	Mathematics anxiety is a multidimensional phenomenon influenced by personal, academic, social, and instructional factors. Both school-related and family-related variables contribute to	5	To suggest suitable educational and psychological strategies for reducing mathematics anxiety and improving academic achievement among higher secondary school students. / What strategies can be adopted to reduce mathematics anxiety and enhance academic achievement among higher secondary school students?	Participants recommended activity-based learning, supportive classroom environments, remedial instruction, counseling services, peer collaboration, positive teacher feedback, continuous assessment, and stress-management programmes. Teachers emphasized the importance of making mathematics learning more engaging and	Effective reduction of mathematics anxiety requires a combination of educational and psychological interventions. Positive classroom practices and emotional support mechanisms can improve students' confidence, motivation, and academic achievement.

	student-centered.	
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Major Themes, Findings, and Interpretations

Major Theme	Key Findings	Interpretation
Mathematics Anxiety	Students experienced fear, tension, nervousness, and low confidence while learning mathematics.	Mathematics anxiety is prevalent among higher secondary students and influences their learning experiences.
Academic Achievement	Achievement levels varied according to students' confidence, preparedness, and engagement in mathematics learning.	Academic success is influenced by both cognitive abilities and emotional factors.
Anxiety–Achievement Relationship	High-anxiety students generally demonstrated lower academic performance compared to low-anxiety students.	Mathematics anxiety negatively affects academic achievement.
Contributing Factors	Examination pressure, fear of failure, difficult content, parental expectations, and teaching methods were major sources of anxiety.	Mathematics anxiety arises from multiple educational, psychological, and social influences.
Intervention Strategies	Students and teachers recommended counseling, supportive teaching, interactive	Appropriate interventions can reduce anxiety and enhance achievement

	learning, and continuous practice.	in mathematics.
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The analysis indicates that mathematics anxiety is a significant psychological factor affecting higher secondary school students in West Bengal. Students experiencing higher levels of anxiety often encounter difficulties in concentration, participation, and examination performance, which ultimately influence their academic achievement. The findings suggest that mathematics anxiety and academic achievement are closely related, with increased anxiety contributing to reduced performance. Furthermore, mathematics anxiety is shaped by various interrelated factors, including academic pressure, fear of failure, instructional practices, parental expectations, and learners' previous experiences with mathematics. The study also highlights that supportive classroom environments, learner-centered instructional approaches, counseling services, and positive teacher-student relationships can play a vital role in reducing anxiety and improving academic achievement. Therefore, addressing mathematics anxiety should be considered an important component of educational planning and classroom practice at the higher secondary level.

Findings and Evaluation of the Study

: Findings of the Study

Sl. No.	Area of Investigation	Findings
1	Level of Mathematics Anxiety	The majority of higher secondary students reported moderate to high levels of mathematics anxiety characterized by fear, nervousness, tension, and lack of confidence during mathematics learning and examinations.
2	Academic Achievement	Students demonstrated

	in Mathematics	varying levels of achievement in mathematics. Learners with positive attitudes and confidence generally performed better than students experiencing high anxiety.			anxiety were less likely to participate actively in classroom discussions, problem-solving activities, and collaborative learning tasks.	
3	Relationship between Mathematics Anxiety and Academic Achievement	A negative association was observed between mathematics anxiety and academic achievement. Students with higher anxiety tended to exhibit lower academic performance in mathematics.		6	Cognitive Impact of Anxiety	Mathematics anxiety affected concentration, memory retention, problem-solving ability, and decision-making during mathematical tasks and examinations.
4	Contributing Factors to Mathematics Anxiety	Major factors included examination pressure, fear of failure, complex mathematical concepts, inadequate foundational knowledge, parental expectations, negative classroom experiences, and teacher-centered instructional practices.		7	Teacher Perspectives	Teachers acknowledged that mathematics anxiety adversely affects students' confidence, motivation, and classroom performance.
5	Classroom Learning Experiences	Students experiencing mathematics		8	Suggested Intervention Strategies	Participants recommended supportive classroom environments, activity-based teaching, counseling services, peer learning, continuous assessment, and positive reinforcement to reduce anxiety and improve achievement.

Evaluation of the Findings

Sl. No.	Findings	Evaluation
1	Moderate to high levels of mathematics anxiety were observed among students.	This indicates that mathematics anxiety remains a significant educational and psychological issue requiring immediate attention in higher secondary education.
2	Students with lower anxiety demonstrated better academic performance.	The finding supports the view that emotional well-being significantly influences academic achievement and learning outcomes.
3	A negative relationship exists between mathematics anxiety and academic achievement.	The finding is consistent with previous research suggesting that increased anxiety adversely affects students' mathematical performance.
4	Multiple factors contribute to mathematics anxiety.	Mathematics anxiety is a multidimensional phenomenon influenced by personal, academic, instructional, and social variables.
5	Anxious students showed reduced classroom participation.	Anxiety not only affects examination performance but also limits active engagement in the learning process.
6	Anxiety negatively influenced concentration and problem-	The finding demonstrates that mathematics anxiety affects cognitive

	solving ability.	functioning and learning efficiency.
7	Teachers recognized the adverse effects of mathematics anxiety.	Teachers can play a critical role in identifying anxiety and implementing supportive instructional practices.
8	Educational and psychological interventions were suggested by participants.	Effective intervention programmes can help reduce anxiety, improve confidence, and enhance mathematics achievement among students.

Overall Evaluation

Aspect	Evaluation
Educational Significance	The study highlights mathematics anxiety as a major barrier to effective mathematics learning and academic success among higher secondary students.
Psychological Significance	The findings emphasize the importance of addressing emotional and affective factors alongside cognitive development in mathematics education.
Practical Significance	The study provides valuable insights for teachers, counselors, parents, and educational administrators to develop strategies for reducing mathematics anxiety.
Policy Significance	The findings support the inclusion of psychological support services, learner-centered pedagogy, and mathematics counseling programmes within school education systems.
Future Implications	Reducing mathematics anxiety can contribute to

	improved academic achievement, enhanced self-confidence, greater participation in STEM disciplines, and better educational outcomes.
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Conclusion

The present study examined the relationship between mathematics anxiety and academic achievement among higher secondary school students in West Bengal. The findings revealed that mathematics anxiety is a significant psychological factor affecting students' learning and performance in mathematics. A considerable number of students reported experiencing fear, tension, nervousness, and lack of confidence while dealing with mathematical concepts and problem-solving activities.

The study further indicated that academic achievement in mathematics is not determined solely by intellectual ability but is also influenced by emotional and motivational factors. Students who demonstrated higher confidence, better preparation, and positive engagement with mathematics generally achieved better academic outcomes. In contrast, students with high levels of mathematics anxiety tended to perform poorly in examinations and classroom assessments.

A significant negative relationship was observed between mathematics anxiety and academic achievement, suggesting that increased anxiety is associated with lower performance in mathematics. The findings support previous research indicating that anxiety can interfere with concentration, memory, reasoning, and problem-solving abilities, thereby reducing students' academic success.

The study also identified several contributing factors to mathematics anxiety, including examination pressure, fear of failure, difficult mathematical content, parental expectations, and ineffective teaching methods. These factors highlight the multidimensional nature of mathematics anxiety and emphasize the need for comprehensive intervention strategies.

Based on the findings, it is concluded that reducing mathematics anxiety should be considered a priority in educational practice. Teachers, parents, counselors, and educational institutions should work collaboratively to create supportive learning environments that encourage confidence, active participation, and positive attitudes toward mathematics. The implementation of student-centered teaching

methods, continuous practice opportunities, counseling services, and motivational support can help alleviate anxiety and improve academic achievement. Ultimately, fostering a positive mathematical learning experience will contribute to better educational outcomes and overall student development.

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