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A Study on Mathematics Anxiety in School Students and the Role of Teachers' Attitude and Behaviour

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Abstract:
This study investigates the relationship between mathematics teacher attitudes and students' mathematical anxiety in a primary school classroom. The research employed a descriptive classroom-based design with a sample of 30 students aged 9–12 years. Two instruments were used for data collection: the Mathematics Teacher Attitude and Behaviour Scale (MTABS) and the Mathematics Anxiety Scale (MAS). Descriptive statistics and Pearson's correlation analysis were used to analyze the data. Results indicated a moderate level of mathematical anxiety among students. Students generally perceived their teacher's behaviour positively. The correlation analysis revealed a weak negative relationship between teachers' behaviour and students' mathematics anxiety. The findings suggest that although positive teacher behaviour may contribute to reducing anxiety, mathematical anxiety is influenced by multiple psychological and contextual factors.

Keywords: Mathematics Anxiety, Teacher Behaviour, School Students, Teacher Attitude

Introduction:

Mathematics anxiety is a psychological condition characterized by feelings of tension, fear, or apprehension that interfere with the manipulation of numbers and the solving of mathematical problems (Mark H. Ashcraft & Amy M. Moore, 2009; Richard Hembree, 1990). It has been widely recognized as a significant factor affecting students' performance, participation, and persistence in mathematics learning (Ann Dowker et al., 2016; Emily Carey et al., 2017).

Students experiencing mathematics anxiety often exhibit avoidance behaviour, reduced self-efficacy, and lower academic achievement (Sian L. Beilock et al., 2010; Elizabeth A. Gunderson et al., 2018). From a cognitive interference perspective, anxiety consumes working memory resources, thereby impairing problem-solving efficiency (Ashcraft & Moore, 2009).

From a social learning theory perspective, proposed by Albert Bandura (1977), students' beliefs and emotional responses toward mathematics are shaped through observation, reinforcement, and interaction within the classroom environment. Teachers, therefore, act as significant social agents whose behaviours influence students' confidence and attitudes.

Additionally, constructivist theory, associated with Lev Vygotsky (1978), emphasizes that learning occurs through social interaction and guided support. A supportive teacher facilitates learning within the learner's Zone of Proximal Development, thereby reducing anxiety and promoting conceptual understanding.

Teachers play a critical role in shaping students' emotional responses toward mathematics through their instructional practices, classroom interactions, and attitudes toward learners (Hembree, 1990; Carter, 2021). Positive teaching behaviours—such as encouragement, patience, and constructive feedback can foster a supportive learning environment that enhances student confidence. Conversely, negative classroom practices, including harsh criticism, excessive evaluation pressure, and unfavourable comparisons, may intensify anxiety and hinder learning (Dowker et al., 2016).

Mathematical anxiety is a psychological condition characterized by feelings of tension, fear, or apprehension when individuals are required to engage in mathematical tasks. It has been widely recognized as a significant factor affecting students' performance and participation in mathematics learning. Students experiencing mathematics anxiety often avoid mathematical tasks, show reduced confidence, and demonstrate lower academic achievement. Teachers play a critical role in shaping students' emotional responses toward mathematics through their instructional practices, classroom interactions, and attitudes toward learners.

Teachers influence students' emotional experiences in the mathematics classroom through their teaching style, communication patterns, and classroom management practices. Supportive teachers who encourage questions, provide clear explanations, and create a positive classroom environment can reduce students' anxiety.

A positive classroom environment characterized by fairness, patience, and constructive feedback contributes to students' confidence in mathematical problem solving. Conversely, negative classroom practices such as harsh criticism, comparison among students, and rapid pacing of lessons may increase students' anxiety.

Research Questions

1. 1.How do primary school students perceive the attitudes and behaviours of their mathematics teacher during classroom instruction?
2. What is the level of mathematical anxiety among primary school students?
3. What is the relationship between teacher behaviour and students' mathematical anxiety in primary school classroom?

Objectives of the Study

1. To examine students' perceptions of teacher attitudes and behaviours in mathematics instruction.
2. To assess the level of mathematical anxiety among primary school students.
3. To examine the relationship between teacher behaviour and students' mathematical anxiety.

Hypothesis

H_{01}: No hypothesis is generated because students' perceptions about teachers' attitudes and behaviours in mathematics instruction is studied.

H_{02}: No hypothesis is generated because level of Mathematical Anxiety is studied.

H_{03}: There is no significant relationship between teacher attitude and students' mathematical anxiety.

Review of Related Literature

Math anxiety has been studied a lot. Ashcraft and Moore (2009) found that bad experiences in class can make students anxious and that this anxiety can hurt how well they solve problems. Beilock et al. (2010)

showed that tests and exams often increase this stress, especially for younger students.

Teachers can make a big difference. Hembree (1990) showed that students feel less anxious when teachers create a kind and supportive classroom. Teachers who make math fun and use real-life examples help students feel confident (Blazer, 2011).

Carter (2021) found that students who see their teachers as kind and friendly are less scared of math. Smith et al. (2023) talked about how teachers who change their ways of teaching to match student needs can reduce stress. Martinez and Kim (2023) said that working in groups and helping each other can also reduce math fear. Gupta and Sharma (2022) explained that showing students how math works in real life makes them less afraid.

Mathematics anxiety refers to feelings of tension, apprehension, or fear that interfere with the manipulation of numbers and the solving of mathematical problems. Previous studies have shown that mathematical anxiety can negatively influence students' academic achievement and willingness to participate in mathematical activities.

Methodology

Research Design

The study adopted a descriptive research design conducted in a natural classroom setting. The research aimed to observe and analyze the relationship between teacher behaviour and students' mathematical anxiety without manipulating any variables.

Population and Sample

The study was conducted in a primary school classroom consisting of 30 students aged between 9 and 12 years. Since the class size was limited, all students in the classroom were included in the study using a census approach.

Research Tools

Two instruments were used for data collection: (1) Mathematics Teacher Attitude and Behaviour Scale (MTABS), which measured students' perceptions of teacher attitudes and behaviours, and (2) Mathematics Anxiety Scale (MAS), which measured students' levels of mathematics anxiety.

Data Analysis

Objective1: To examine students' perceptions of teacher attitudes and behaviours in mathematics instruction.

Item No.	Not at all (Freq)	Occasionally (Freq)	Usually (Freq)	Often (Freq)	Always (Freq)	Total
1	5	6	6	7	6	30
2	8	3	7	7	5	30
3	5	3	7	11	4	30
4	8	4	4	8	6	30
5	6	6	5	8	5	30
6	6	5	9	7	3	30
7	10	6	7	5	2	30
8	5	3	4	12	6	30

9	8	6	5	7	4	30
10	6	3	8	8	5	30
11	7	8	6	4	5	30
12	4	5	6	10	5	30
13	8	6	6	5	5	30
14	6	6	8	2	8	30
15	7	2	6	10	5	30
16	1	4	8	8	9	30
17	5	8	6	7	4	30
18	8	6	2	9	5	30
19	4	7	6	7	6	30
20	6	5	5	9	5	30

Table: 1: This table presents the frequency of responses for each item in the Mathematics Teacher Attitude and Behavior Scale. The tool consists of 20 items rated Likert option.

Item No.	Not at all %	Occasionally %	Usually %	Often %	Always %	Total
1	16.66	20	20	23.33	20	100
2	26.66	10	23.33	23.33	16.66	100
3	16.66	10	23.33	36.66	13.33	100
4	26.66	13.33	13.33	26.66	20	100
5	20	20	16.66	26.66	16.66	100
6	20	16.66	30	23.33	10	100
7	33.33	20	23.33	16.66	6.66	100
8	16.66	10	13.33	40	20	100
9	26.66	20	16.66	23.33	13.33	100
10	20	10	26.66	26.66	16.66	100
11	23.33	26.66	20	13.33	16.66	100
12	13.33	16.66	20	33.33	16.66	100
13	26.66	20	20	16.66	16.66	100
14	20	20	26.66	6.66	26.66	100
15	23.33	6.66	20	33.33	16.66	100
16	3.333	13.33	26.66	26.66	30	100
17	16.66	26.66	20	23.33	13.33	100
18	26.66	20	6.66	30	16.66	100
19	13.33	23.33	20	23.33	20	100
20	20	16.66	16.66	30	16.66	100

Table:2: This table presents the percentage of responses for each item in the Mathematics Teacher Attitude and Behavior Scale. The tool consists of 20 items rated Likert option.

Not at all (%)	Occasionally (%)	Usually (%)	Often (%)	Always (%)
20.50%	17%	20.16%	25.16%	17.16%

Table:3: This table presents the overall response distribution

Discussion:

The overall percentage distribution reflects students' perceptions of their mathematics teacher's attitudes and behaviours across all items of the scale. The largest proportion of responses falls under the category 'Often' (25.16%), followed by 'Not at all' (20.50%), 'Usually' (20.16%), 'Always' (17.16%), and 'Occasionally' (17%). This distribution indicates that students' perceptions are spread across all response categories, showing variation in how they experience their teacher's behaviour in mathematics instruction. The percentage under 'Occasionally' (17%) is also important, as it suggests that a notable group of students perceive supportive or desirable teacher behaviours only from time to time rather than consistently. This implies that positive teacher attitudes and behaviours may not be uniformly experienced by all students in the classroom. While the combined percentages of 'Often' and 'Always' suggest that many students generally view their teacher positively, the responses under 'Not at all,' 'Occasionally,' and 'Usually' reveal that a substantial proportion of students experience inconsistency in teacher support and behaviour.

Overall, the table suggests that although positive teacher attitudes and behaviours are present in the classroom, they are not perceived equally by all students. This highlights the need for greater consistency in supportive teaching practices so that every learner feels encouraged, understood, and comfortable during mathematics instruction.

Objective 2: To assess the level of mathematical anxiety among primary school students.

Item No.	Not at all (Freq)	Occasionally (Freq)	Usually (Freq)	Often (Freq)	Always (Freq)	Total
1	0	15	11	4	0	30
2	2	15	9	3	1	30
3	1	12	11	4	2	30
4	1	11	13	4	1	30
5	2	14	12	2	0	30
6	0	15	11	2	2	30
7	0	13	14	3	0	30
8	3	12	7	7	1	30
9	1	9	14	4	2	30
10	1	16	4	6	3	30
11	1	14	12	2	1	30
12	1	15	10	3	1	30
13	1	15	9	5	0	30
14	1	12	11	1	5	30
15	0	10	12	7	1	30

16	0	17	6	6	1	30
17	0	19	5	4	2	30
18	1	12	9	4	4	30
19	1	16	10	3	0	30
20	1	13	11	5	0	30
21	0	13	11	5	1	30
22	1	11	8	7	3	30
23	1	17	7	4	1	30
24	0	16	6	6	2	30
25	0	16	8	6	0	30
26	1	13	9	6	1	30
27	1	6	9	8	6	30
28	1	10	9	9	1	30
29	0	16	7	5	2	30
30	1	14	10	2	3	30
31	0	19	8	3	0	30
32	0	15	11	3	1	30
33	2	10	15	3	0	30
34	0	13	14	2	1	30
35	0	16	9	4	1	30
36	1	17	11	0	1	30

Table: 4: This table presents the frequency of responses for each item in the Mathematical Anxiety Scale. The tool consists of 36 items rated Likert option.

Item No.	Not at all %	Occasionally %	Usually %	Often %	Always %	Total
1	0	50	36.66	13.33	0	100
2	6.66	50	30	10	3.33	100
3	3.33	40	36.66	13.33	6.66	100
4	3.33	36.66	43.33	13.33	3.33	100
5	6.66	46.66	40	6.66	0	100
6	0	50	36.66	6.66	6.66	100
7	0	43.33	46.66	10	0	100
8	10	40	23.33	23.33	3.33	100
9	3.33	30	46.66	13.33	6.66	100
10	3.33	53.33	13.33	20	10	100
11	3.33	46.66	40	6.66	3.33	100
12	3.33	50	33.33	10	3.33	100
13	3.33	50	30	16.66	0	100
14	3.33	40	36.66	3.33	16.66	100
15	0	33.33	40	23.33	3.33	100
16	0	56.66	20	20	3.33	100

17	0	63.33	16.66	13.33	6.66	100
18	3.33	40	30	13.33	13.33	100
19	3.33	53.33	33.33	10	0	100
20	3.33	43.33	36.66	16.66	0	100
21	0	43.33	36.66	16.66	3.33	100
22	3.33	36.66	26.66	23.33	10	100
23	3.33	56.66	23.33	13.33	3.33	100
24	0	53.33	20	20	6.66	100
25	0	53.33	26.66	20	0	100
26	3.33	43.33	30	20	3.33	100
27	3.33	20	30	26.66	20	100
28	3.33	33.33	30	30	3.33	100
29	0	53.33	23.33	16.66	6.66	100
30	3.33	46.66	33.33	6.66	10	100
31	0	63.33	26.66	10	0	100
32	0	50	36.66	10	3.33	100
33	6.66	33.33	50	10	0	100
34	0	43.33	46.66	6.66	3.33	100
35	0	53.33	30	13.33	3.33	100
36	3.33	56.66	36.66	0	3.33	100

Table:5: This table presents the percentage of responses for each item in the Mathematical Anxiety Scale. The tool consists of 36 items rated Likert option.

Not at all (%)	Occasionally (%)	Usually (%)	Often (%)	Always (%)
2.50%	46.08%	32.68%	14.07%	4.72%

Table: 6: This table presents the overall response distribution

Discussion:

The overall percentage distribution presents a clear pattern of students' responses across all items of the Mathematics Anxiety Scale. A substantial proportion of responses falls under the categories 'Occasionally' (46.08%) and 'Usually' (32.68%), indicating that most students experience mathematical anxiety at moderate levels. The relatively lower percentages in the 'Often' (14.07%) and 'Always' (4.72%) categories suggest that severe or frequent anxiety is present but limited to a smaller group of students. Additionally, the minimal percentage of responses under 'Not at all' (2.50%) reflects that very few students are completely free from anxiety related to mathematics.

Overall, this distribution demonstrates that mathematical anxiety is not an isolated phenomenon but is experienced by most students to varying degrees, predominantly at occasional to usual levels.

Objective 3: To examine the relationship between teacher behaviour and students' mathematical anxiety. Descriptive statistics including mean and standard deviation were calculated. Pearson's correlation coefficient was used to examine the relationship between teacher behaviour and students' mathematical

anxiety.

Results

Variable	N	Mean	SD
Mathematics Anxiety (MAS)	30	98.10	9.02
Teacher Behaviour (MTABS)	30	60.30	6.89

Table 7: Descriptive Statistics of Study Variables

Variables	Correlation (r)	N
MTABS – MAS	-0.078	30

Table 8: Correlation between Teacher Behaviour and Mathematics Anxiety

Discussion:

The correlation analysis reveals a weak negative association ($r = -0.078$) between teacher behaviour and mathematical anxiety. The low magnitude of the coefficient indicates that the relationship lacks strength and practical significance. Hence, although supportive teacher behaviour may help in reducing anxiety to some extent, mathematical anxiety appears to be influenced by a combination of cognitive, emotional, and environmental factors.

Findings

The findings indicate that students generally perceive their mathematics teacher's attitudes and behaviours as positive, as reflected by higher responses in the 'Often' and 'Always' categories. However, the presence of substantial responses in 'Not at all,' 'Occasionally,' and 'Usually' suggests variability in students' experiences. This implies that while supportive teacher behaviour exists, it is not consistently experienced by all students, highlighting the need for more uniform and inclusive teaching practices in the mathematics classroom.

The findings reveal that most students experience mathematical anxiety at moderate levels, as indicated by higher responses in the 'Occasionally' and 'Usually' categories. The relatively lower responses in 'Often' and 'Always' suggest that severe anxiety is limited to a smaller group, while the minimal 'Not at all' responses indicate that very few students are completely free from anxiety. Overall, mathematical anxiety is found to be a common experience among students, though predominantly at moderate intensity. Although the findings indicate a very weak negative relationship between teacher behaviour and mathematical anxiety suggesting that supportive teacher behaviour may slightly reduce students' anxiety, its overall influence is minimal. This implies that mathematical anxiety is influenced by multiple factors beyond teacher behaviour influence the emotional and instructional environment of the classroom.

Conclusion

The findings indicate that students in the observed classroom experience a moderate level of mathematics anxiety. Although students perceived their teacher's behaviour positively, the relationship between teacher behaviour and mathematical anxiety was weak. Teachers should create emotionally safe learning environments, encourage student participation, and avoid practices that may increase anxiety such as harsh

criticism or comparison among students. A supportive learning environment fosters students' confidence in mathematics, which ultimately contributes to reducing their level of mathematical anxiety. Creating a positive classroom environment not only helps reduce anxiety but also builds students' confidence in Mathematics. This suggests that mathematical anxiety is influenced by multiple factors including prior learning experiences, peer comparison, and fear of evaluation.

Recent research indicates that mathematics anxiety is a multidimensional phenomenon shaped by cognitive, emotional, and environmental influences such as classroom interactions and evaluation pressure (Carey et al., 2017; Dowker et al., 2016; Gunderson et al., 2018).The integration of evolving communication and information technologies into pedagogical frameworks offers a significant opportunity to expand research into the cognitive dimensions of learning. To optimize the evolution of educational structures, institutional agencies must adopt a dual strategy of preserving foundational stability and facilitating structural transformation. This requires a collective commitment to fostering a mindset capable of identifying and pre-emptively addressing the specific practices that induce psychological barriers to learning. Consequently, it is imperative to cultivate mathematical learning environments that are both intellectually rigorous and pedagogically effective, ensuring that the time invested results in a profound evolution of the learner's understanding.

MANUSCRIPT CONFIRMATION: This manuscript has been reviewed and approved by Integral University and bears a confirmation number.

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