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The Role of Teachers in Reducing Fear of Mathematics among School Students: A Narrative Review

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Abstract

Fear of mathematics is not simply a dislike of difficult calculations. For many school students, mathematical tasks become associated with worry about mistakes, public embarrassment, speed, or disappointing adults. Such experiences can interfere with participation and may reinforce gaps in understanding. This paper examines how teachers can respond to mathematics anxiety through instructional choices, classroom relationships, assessment practices, and collaboration with families. It is a narrative review of selected published research and educational guidance, rather than a report of a new survey or experiment. The discussion considers the reciprocal relationship between anxiety, avoidance, and performance; the importance of teachers' beliefs and expectations; and the value of tasks that develop reasoning rather than reward speed alone. It argues that a supportive classroom is not one in which challenge is removed, but one in which students receive enough structure and trust to engage with challenge. Practical approaches include diagnosing foundational gaps, using multiple representations, allowing thinking time, discussing errors respectfully, giving actionable feedback, and evaluating progress in more than one way. The review also notes that interventions require sensitivity to students' ages and contexts, and that no single classroom strategy guarantees a reduction in anxiety. It concludes with implications for school practice and priorities for further research.

Keywords: mathematics anxiety; mathematics education; teacher practices; student confidence; formative assessment; growth mindset; school students

1. Introduction

Mathematics occupies a distinctive place in school education. It provides a language for describing quantities, patterns, relationships, and uncertainty, while also supporting learning in science, economics, and everyday decision-making. Yet students who participate confidently in other subjects may become silent or visibly uncomfortable during a mathematics lesson. The explanation is not always a lack of ability. Some students know a procedure but cannot retrieve it under pressure; others have missed an earlier concept and interpret subsequent difficulty as evidence that they are incapable of mathematics.

Mathematics anxiety refers broadly to feelings of tension or apprehension associated

with mathematical activity. It can emerge during classroom questioning, homework, tests, or informal calculations. A meta-analysis of school-aged students reported a moderate negative association between mathematics anxiety and mathematical performance (Namkung et al., 2019). This association should not be reduced to a simple claim that anxiety always causes low achievement: difficulty and repeated failure may also increase anxiety, and classroom conditions can influence both.

International evidence points to the scale of the concern. The OECD's reporting on PISA 2022 found that, across OECD countries, many students worried about poor mathematics grades and felt anxious about mathematical failure (OECD, 2024). These patterns should not be assumed to describe every country or individual classroom equally; they nevertheless underline why the emotional experience of learning mathematics deserves serious educational attention.

Teachers occupy a practical position in this discussion. They select examples, respond to wrong answers, establish the pace of lessons, interpret student errors, and communicate what counts as success. The question addressed here is therefore not whether teachers alone are responsible for mathematics anxiety, but how their everyday practices may help prevent or reduce avoidable fear while maintaining meaningful mathematical expectations.

2. Aim, Objectives and Scope

The aim of this paper is to critically discuss the role of teachers in helping school students approach mathematics with greater confidence and understanding. Specifically, it seeks to identify classroom experiences that may contribute to anxiety; examine research concerning teacher beliefs, communication, and students' mathematical experiences; describe feasible teaching and assessment practices; and consider the limitations of existing evidence and implications for school-based practice.

The paper focuses on primary and secondary school settings. It discusses classroom practice rather than clinical diagnosis or treatment. The terms fear of mathematics and mathematics anxiety are used in a related, broad educational sense, while recognizing that researchers may operationalize anxiety through specific scales and measures.

3. Approach and Review Method

This is a narrative, conceptually organized review. It develops the themes of the original manuscript and interprets selected published sources that directly address mathematics anxiety, student achievement, teacher influence, and school practice. Sources were selected for relevance to these questions and for the availability of identifiable publication details. The synthesis is organized by possible sources of anxiety, the teacher's role, instructional responses, and school-level implications. It does not claim exhaustive database coverage, formal systematic-review screening, or meta-analytic estimation. No participants were recruited, no questionnaire was administered, and no primary data were collected for this paper.

This approach permits a practical discussion of the literature but also sets limits on inference. Findings from one age group, national setting, or research design cannot automatically be generalized to all school students. Strategies proposed below should therefore be regarded as evidence-informed possibilities requiring thoughtful implementation, not as effects demonstrated by a new intervention conducted for this article.

4. Mathematics Anxiety: Sources and Learning Consequences

Fear of failure is one of the most recognizable sources of mathematics-related distress. When classroom participation is treated as a public test of intelligence, even

a small error can appear costly. Students may avoid raising their hands, copy an answer instead of asking for clarification, or abandon a challenging problem before testing a possible solution. Repeated avoidance then removes opportunities to strengthen understanding. A learner who misses an essential idea in fractions may experience later difficulties with ratio, algebra, or proportion, making the next lesson feel more threatening than the last.

Speed is another concern. Quick recall is useful for some mathematical tasks, but speed alone is not a reliable measure of conceptual understanding. A student who can explain a sound solution after reflection may mistakenly conclude that they are weak in mathematics when compared with a faster peer. Highly time-pressured questioning may therefore conceal careful mathematical thinking. The goal is not to abolish practice or fluent recall, but to distinguish situations designed to build fluency from those intended to cultivate reasoning.

Memorization also has a legitimate but limited role. Important facts, symbols, and procedures have to become familiar. However, when rules are taught without explanation, students may treat each topic as a growing list of disconnected instructions. Forgetting one rule then becomes a source of panic. Linking procedures to visual, verbal, and concrete representations makes it easier to reconstruct an idea rather than depend entirely on memory.

Anxiety and performance can influence each other in complex ways. Namkung et al. (2019), in a meta-analysis of 131 studies, found a negative relationship between mathematics anxiety and performance among school-aged learners. Their synthesis supports the importance of the issue but does not by itself establish one universal causal sequence for every child. Early-school research further suggests that anxiety may be related to students' choice and use of mathematical problem-solving strategies (Ramirez et al., 2016). This makes it particularly important to investigate what students actually understand rather than assume that every hesitation is a deficit in effort.

5. Teacher Beliefs, Expectations and Classroom Language

Teachers communicate beliefs about mathematical ability through more than formal instruction. A hurried correction, a comparison with a classmate, or praise focused solely on being "naturally brilliant" may shape how a student interprets difficulty. By contrast, feedback that identifies the reasoning already achieved and the next step to attempt gives students a more usable picture of progress. The difference is not superficial positivity: meaningful encouragement has to be tied to accessible instruction and specific mathematical ideas.

A growth-oriented approach treats mathematical capability as something that can develop with instruction, strategies, practice, and support. This is more credible when a teacher responds to an error by investigating it. Instead of saying "You should know this by now," a teacher can ask, "Which step becomes uncertain?" or "Can we represent this another way?" Such questions preserve academic expectations while removing unnecessary humiliation. Teachers should also avoid implying that effort alone guarantees immediate success; students often require clearer explanations, prerequisite instruction, or additional time.

Teachers' own anxieties matter as well. In a study of early elementary classrooms, Beilock et al. (2010) reported an association between female teachers' mathematics anxiety, girls' gender-related beliefs, and girls' later mathematical achievement in that setting. The authors noted that the effects were relatively small and that other influences also matter. The finding should not be simplified into a judgment about female teachers. Its educational implication is broader: teachers benefit from opportunities to strengthen their own mathematical confidence, challenge stereotypes,

and reflect on the messages conveyed through everyday teaching.

A respectful classroom does not require praising every answer as correct. Students need accuracy. The essential distinction is between evaluating a mathematical claim and judging the person who made it. A teacher can explain why an answer is incorrect while also treating the attempt as a legitimate contribution to collective reasoning.

6. Teaching Practices That Can Make Mathematics More Approachable

Conceptual sequencing should be a first priority. Before introducing a demanding new procedure, teachers can use a short diagnostic activity to see whether students possess the necessary foundation. If several learners struggle with division of fractions, for example, the problem may concern the meaning of division or fractions rather than the most recent formula. A carefully chosen worked example, visual diagram, or concrete model can address the difficulty more effectively than repeated instructions to memorize the rule.

Multiple representations make abstract ideas easier to discuss. A ratio can be expressed with objects, a drawing, a table, or an equation; a linear relationship can be explored through a verbal description, a graph, and an algebraic expression. Moving between representations helps students recognize underlying structure. It also provides more than one entry point into a problem, which may be especially valuable for learners who feel overwhelmed by symbolic notation alone. Discussion should reward explanation, not merely the first correct answer. Teachers can offer silent thinking time before inviting responses and then ask students to compare two plausible approaches. Pair discussion may allow hesitant students to test an idea in a smaller setting. Questions such as “How do you know?” and “Will this method always work?” encourage precision without making rapid recall the central measure of competence.

Errors deserve careful attention. An incorrect subtraction, a misplaced decimal point, or a mistaken assumption about area can reveal a pattern in a student’s reasoning. Rather than treating every wrong answer as an interruption, teachers may ask pupils to locate the first step where their method diverges from a valid one. This must be done without publicly singling out an anxious child. Anonymous examples or teacher-created sample solutions often make error analysis safer and more productive.

Familiar contexts can reduce the apparent distance between school mathematics and everyday life. Comparing prices, estimating the materials needed for a classroom display, planning a small budget, or measuring a space may open productive conversations about numbers and shapes. Such tasks should not become decorative stories unrelated to the intended concept. Their value lies in making the mathematical relationship visible and in allowing students to explain why an answer makes sense. Structured practice remains important. Confidence is not built by encouragement alone; students also need repeated opportunities to succeed with gradually increasing independence. Teachers can begin with guided examples, move to paired work, and finally set questions that pupils attempt independently. Short cumulative reviews can help maintain earlier skills and reduce the shock of meeting familiar ideas in a new form.

7. Feedback and Assessment without Unnecessary Pressure

Assessment communicates what a school values. If every mathematics activity is scored primarily for speed and correctness, students may learn to conceal uncertainty rather than explore it. An alternative is to combine accurate assessment of knowledge with low-stakes opportunities to make and correct errors. Brief exit questions,

observation of solution methods, and oral explanations can reveal misconceptions while they are still manageable.

Effective feedback is specific enough to support action. "Try harder" gives little direction; "Your equation is correct, but the units were not converted before substitution" identifies a repairable step. Feedback also needs to acknowledge genuine progress without inflating achievement. For a student who has struggled, recognizing an improved representation or a sound explanation can provide a concrete basis for further effort.

Allowing students to revise work can separate learning from the emotional finality of a single incorrect answer. Teachers might ask pupils to annotate corrections, explain an alternative method, or revisit a question after instruction. These practices do not require lowering standards. They make the route to meeting those standards more visible. When timed tasks are necessary, their purpose should be clear, and students should have other opportunities to demonstrate conceptual understanding.

Teachers should distinguish ordinary mathematical apprehension from severe or persistent distress. A student who consistently becomes highly distressed, avoids attendance, or experiences broader difficulties may require coordinated support from appropriate school staff and family members. Classroom strategies have value, but they should not be presented as a substitute for professional assessment when a child needs it.

8. Collaboration with Parents and the School Community

Messages about mathematics often continue beyond the classroom. Parents may unintentionally pass on the belief that the subject is beyond ordinary learners, particularly when they describe their own long-standing fear of it. Teachers can counter this by suggesting accessible activities that do not turn home life into another examination: estimating shopping totals, comparing measurements, playing number-based games, or discussing the reasoning behind an answer. These invitations should be realistic for families with different resources and available time.

Cooperation among teachers also matters. Students moving from one class to another benefit when expectations about respectful questioning, error correction, and mathematical explanation are broadly consistent. Shared planning can help staff identify recurring misconceptions and design small interventions before gaps widen. Furner and Higgins (2019) emphasize the scope for teacher leadership in addressing mathematics anxiety at the school level. Such leadership may involve professional discussion, lesson observation, and attention to the mathematical confidence of educators themselves.

School leaders can support these practices by allowing time for collaborative planning and by looking beyond examination marks when discussing improvement. Student voice, classroom participation, and evidence of conceptual understanding deserve attention alongside performance indicators. At the same time, schools should avoid claiming success merely because pupils report liking mathematics more; a meaningful evaluation would consider both anxiety-related experiences and learning outcomes.

9. An Integrated Classroom Framework

The ideas reviewed above can be brought together into a practical cycle. Teachers first identify the learning demand and any prerequisite difficulties, then design an accessible explanation or task, observe how students respond, provide specific feedback, and revisit understanding. Attention to anxiety runs through the cycle rather than appearing as a separate motivational activity.

Stage	Teacher action	Intended educational contribution
Notice	Observe avoidance, hesitation, errors and student explanations	Distinguish emotional pressure from conceptual gaps
Connect	Use diagrams, manipulatives and familiar situations	Make underlying relationships more intelligible
Discuss	Allow thinking time and compare strategies respectfully	Encourage reasoning and participation
Respond	Give precise, non-humiliating feedback	Make improvement achievable and visible
Revisit	Use short reviews, corrections and flexible checks	Consolidate understanding and monitor progress

This framework is an instructional synthesis proposed in the present article, not a tested intervention model. Its usefulness would need to be examined through classroom research with appropriate measures and comparison procedures.

10. Discussion and Educational Implications

The literature suggests that mathematics anxiety cannot be addressed through reassurance alone. Fear can arise from cumulative gaps in understanding, socially threatening classroom experiences, unrealistic expectations about speed, and wider beliefs about who is capable of mathematical success. Consequently, effective teaching must attend to the mathematical content and to the conditions under which students are asked to engage with it.

An important distinction emerges between reducing challenge and reducing threat. Students require demanding problems if they are to develop flexible knowledge, but challenge need not involve embarrassment or continual public ranking. It is possible to insist on accurate reasoning while providing time, alternative explanations, and constructive opportunities to revise errors. The teacher's role is to make difficulty intellectually productive instead of personally threatening.

Evidence on teachers' mathematics anxiety also invites reflection within teacher education and professional development. Confidence in explaining concepts, sensitivity to different solution strategies, and awareness of stereotypes deserve sustained attention. Nevertheless, the evidence reviewed here is heterogeneous, and differences in age, classroom culture, research methods, and national context limit simple generalization. Teachers should adapt practices to actual learner needs, not apply a fixed list mechanically.

11. Limitations and Directions for Further Research

This paper uses a selective narrative-review approach. It does not report a reproducible search protocol, quality appraisal of every available study, or quantitative effect estimates of teaching strategies. Although relevant published research supports the importance of mathematics anxiety, the evidence discussed does not establish the independent effectiveness of each classroom recommendation. Some cited studies focus on particular countries or age groups, and international survey figures should not be interpreted as estimates for an individual Indian school.

Future research could examine mathematics anxiety and teaching practices in Indian school contexts using validated age-appropriate measures, classroom observation, and achievement assessments. Studies that follow students over time may clarify whether improvements in instructional climate precede changes in anxiety or whether gains in conceptual understanding help reduce anxiety first. Carefully designed intervention research could also investigate the contribution of feedback, time pressure, peer discussion, teacher professional development, and family engagement, while accounting for baseline achievement and school conditions.

12. Conclusion

Fear of mathematics is a genuine educational concern because it can affect how students participate, interpret mistakes, and approach new ideas. Teachers cannot remove every source of anxiety, but they can influence several experiences that make mathematics appear threatening. When lessons connect new ideas to existing knowledge, allow students time to reason, and treat mistakes as evidence for further teaching rather than personal failure, students have stronger opportunities to develop understanding and confidence.

The central lesson is that a supportive mathematics classroom combines intellectual seriousness with psychological safety. Constructive feedback, suitable practice, meaningful examples, careful assessment, and coordination with families and colleagues all have a place in such an environment. Their value should be judged thoughtfully and, where possible, evaluated through credible school-based evidence. Reducing avoidable fear is not separate from teaching mathematics well; it is part of creating conditions in which more students can engage with mathematical ideas.

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