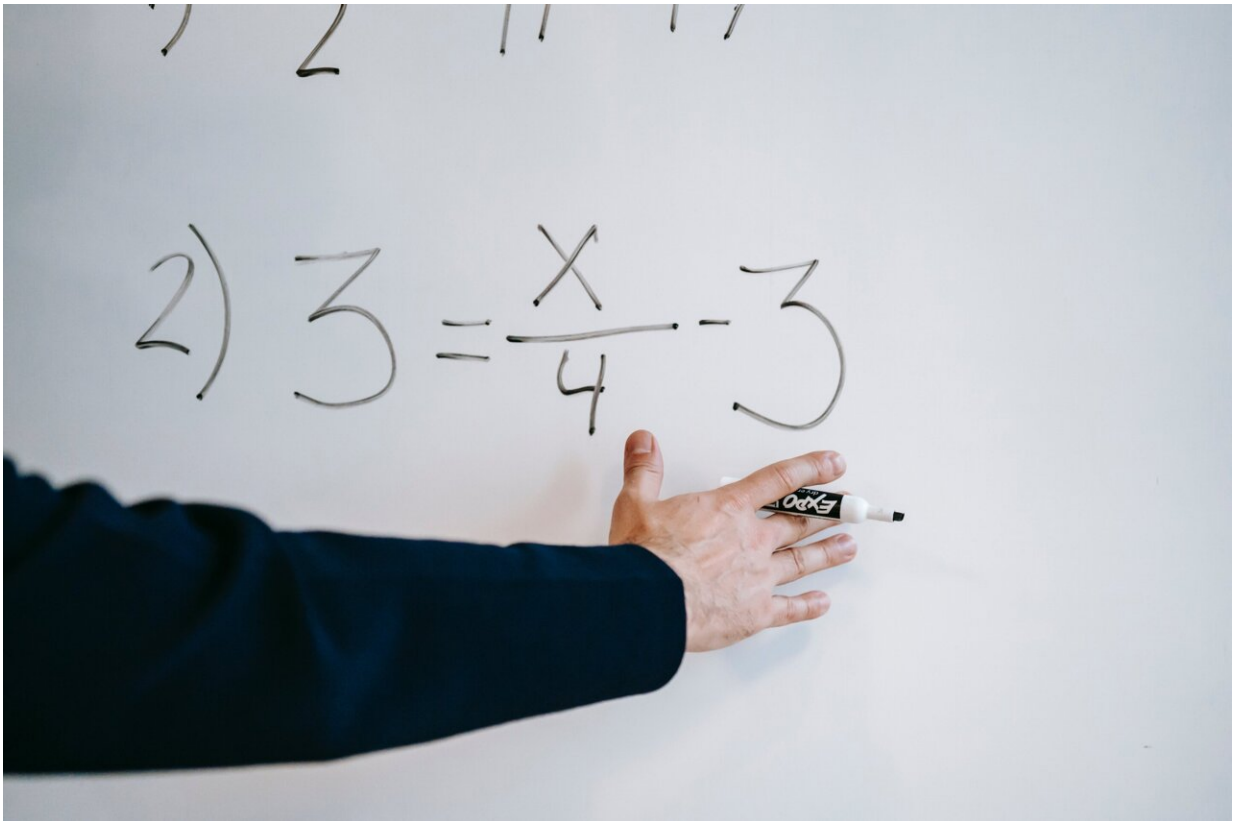


'Math anxiety' causes students to disengage, says study

November 22 2023, by Tom Walters



Credit: Vanessa Garcia from Pexels

A new Sussex study has revealed that "math anxiety" can lead to disengagement and create significant barriers to learning. According to charity National Numeracy, more than one-third of adults in the U.K.

report feeling worried or stressed when faced with math, a condition known as math anxiety.

The [new paper](#), titled "Understanding mathematics [anxiety](#): loss aversion and [student engagement](#)" and published in *Teaching Mathematics and its Applications* finds that teaching which relies on negative framing, such as punishing students for failure, or humiliating them for being disengaged, is more likely to exacerbate math anxiety and disengagement.

The paper says that in order to successfully engage students in math, [educators](#) and [parents](#) must build a [safe environment](#) for trial and error and allow students space to make mistakes and stop learners from reaching the point where the threat of failure becomes debilitating.

Author Dr. C. Rashaad Shabab, Reader in Economics at the University of Sussex Business School, said, "As the government seeks to implement universal math education throughout higher secondary school, potentially a million more people will be required to study math who might otherwise have chosen not to.

"The results of this study deliver important guiding principles and interventions to educators and parents alike who face the prospect of teaching math to children who might be a little scared of it and so are at heightened risk of developing mathematics anxiety.

"Teachers should tell students to look at math as a puzzle, or a game. If we put a piece of a puzzle in the wrong place, we just pick it up and try again. That's how math should feel. Students should be told that it's okay to get it wrong, and in fact that getting it wrong is part of how we learn math. They should be encouraged to track their own improvement over time, rather than comparing their achievements with other classmates.

"All of these interventions, basically take the 'sting' out of getting it

wrong, and it's the fear of that 'sting' that keeps students from disengaging. The findings could pave the way for tailored interventions to support students who find themselves overwhelmed by the fear of failure."

Using behavioral economics, which combines elements of economics and psychology to understand how and why people behave the way they do, the research, from the University of Sussex's Business School, identifies math anxiety as a reason why even dedicated students can become disengaged. This often results in significant barriers to learning, both for the individual in question and others in the classroom.

The paper goes on to say that [modern technology](#) and elements of video game design can help those struggling with mathematics anxiety through a technique called "dynamic difficulty adjustment." This would allow the development of specialist mathematics education computer programs to match the difficulty of [math](#) exercises to the ability of each [student](#). Such a technique, if adopted, would keep the problems simple enough to avoid triggering anxiety, but challenging enough to improve learning.

More information: C Rashaad Shabab, Understanding mathematics anxiety: loss aversion and student engagement, *Teaching Mathematics and its Applications: An International Journal of the IMA* (2023). [DOI: 10.1093/teamat/hrad008](#)

Provided by University of Sussex

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