Tackling Anxiety Helps Level STEM Playing Field

Interventions to reduce anxiety can help close the STEM achievement gap between students from lower-income backgrounds and their more advantaged peers. " Getty

Tackling student anxiety can help close the STEM achievement gap, according to a new study.

Expertise in science and technology can be a great career boost - but it can also be a great social divider: students from disadvantaged backgrounds are less likely to pursue STEM subjects in the later years of high school.
But an intervention aimed at reducing student anxiety through emotional regulation boosted examination scores and cut the failure rate among lower-income students in STEM subjects by half, suggesting it may be one way to help level the STEM playing field.

STEM (science, technology, engineering and math) subjects can open doors and lead to more lucrative careers, with STEM graduates earning almost 20% more in entry-level positions than their peers.

But students from lower-income families are less likely to excel in STEM subjects, and less likely to continue with STEM subjects in the later years of high school.

Now, researchers have found that helping students manage their anxiety made a significant impact in helping lower-income students pass STEM courses.

Working on the basis that lower-income students are particularly affected by anxiety, researchers divided more than 1,000 ninth-grade biology students at a large Midwestern high school into four groups for the study, and devised two interventions aimed at reducing anxiety.

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One group of student took part in one intervention, another group took part in the other, a third group did both while a control group did neither.

An expressive writing task asked students to write about their concerns, on the basis that this can help regulate emotions and "off-load" worries, allowing students to focus more of their attention on their academic performance.

And a reappraisal exercise asked them to reinterpret the arousal they were feeling as "a beneficial and energizing force", rather than a sign of anxiety or failure.

The interventions were carried out before the high-stakes final examinations, which were both their first final examinations in high school and accounted for a
significant proportion of the semester grade.

Researchers found that students who had undertaken one or more of the intervention tasks performed better in the examination that those who had not.

But more significantly, while results were only marginally better for students from higher-income backgrounds, there was a considerable difference for students from lower-income backgrounds.

According to the researchers, "the intervention significantly reduced the raw examination achievement gap between higher- and lower-income students by 29%.

There was no significant difference between the two interventions, in terms of their effect on examination scores.

The anxiety-reducing interventions also made a significant difference to course passing rates, but again, only among lower-income students. While 39% of lower-income students in the control group failed the course, only 18% of lower-income student in one of the intervention groups did so.

This means that the interventions helped reduce the failure rate among lower-income students by more than half.

The study shows that even brief emotion regulation interventions can benefit examination performance and help reduce the gap between economically advantaged and disadvantaged students, according to the researchers, from Columbia, Stanford, Ball State, Michigan and Chicago universities.

‘Students from lower-income backgrounds have been found to have particularly high levels of stress and performance anxiety during evaluative assessments in school,’ the researchers said in the study, published this month in the journal Proceedings of the National Academy of Sciences (PNAS).

‘Students from lower-income backgrounds who are given the opportunity to adaptively regulate their emotional experience before an examination... outperformed lower-income students who were not given a similar opportunity.’
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I’m a freelance journalist specializing in education. My career so far has taken in regional and national newspapers and magazines, including Forbes, The Daily Telegraph and the Guardian. A lot has changed since I started covering education as a wide-eyed junior reporter in...

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