Help is at hand for poor pupils who traditionally struggle in science subjects: Reducing anxiety by facing fears HALVES failure rates among students from low income homes

- Students from low-income families struggle more with science related subjects
- Fewer disadvantaged pupils go into the subjects at university and on to careers
- A US study found that reducing exam anxiety cut failure rates by half
- Helping students regulate their emotions could mean better science results

By YUAN REN FOR MAILONLINE

Failure rates in science, tech, maths and engineering (STEM) subjects among poor pupils could be halved by reducing their anxiety levels immediately before exams.

Researchers found that low-income students who adopted strategies to calm their nerves before a science exam were significantly less likely to fail.

Students from low-income backgrounds are much more likely to fail in STEM subjects at school which can prevent them pursuing related careers.

The latest findings suggest that helping highly-stressed students regulate their emotions could lead to better exam performance.

This was achieved by getting students to face their fears and work with stress to boost their performance, rather than worry about it.

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The study, conducted by Stanford University, was carried out on a group of 1,175 freshman science students at a public high school in Illinois, with 285 students coming from a low socioeconomic background.

Almost 40 per cent of low-income biology students at the school were predicted to fail their course.

The lead psychologist on the study, Dr Christopher Rozek, said that feelings of inadequacy in low-income student groups was likely an important factor behind the academic achievement gap.

While psychological interventions won't close the achievement gap purely through better scores, says Dr Rozek, better exam result will give more students the option of continuing their studies in STEM.

'We want more students from low-income families to pursue STEM subjects because it is a fast growing area with high-income salaries,' Dr Rozek told Mailonline.

The effectiveness of the strategies could be applied more widely across schools and workplaces, he says.

'Low income students in our study were the lowest performing and highest in anxiety levels – but the strategies could be effective in any context of high stress created by negative stereotypes,' he added.

'These can be used by women, for example, in an academic or work situations that is over dominated by men, including in STEM classes or careers.'

HOW THE STUDY WORKED

Over the course of two years, US students aged between 14 and 15 were given strategies to soothe their nerves before high-stake science exams.

Students from both low and high income backgrounds were placed into different groups and given different activities

Each lasted 10 minutes designed to regulate and help them be more mindful of their anxiety

These exercises included writing down their emotions, reading out the positive effects of heightened anxiety on performance, or a combination of the two

Compared to a control group, who were told to ignore their feelings, any one of or combination of the activities significantly improved exam results for low-income students.

The failure rate of students from low-income backgrounds in these exams were cut by half.

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Researchers at Stanford have previously suggested that emotions are important to exam success and that self-regulation and meta-cognition - awareness of one’s thought processes - in particular make up the secret to exam success (stock image).

The latest study saw students placed into different groups before a biology exam and given a number of different 10 minute activities designed to regulate fears and reinterpret their anxiety.

One group of students wrote about their fears, intended to clear their head space before the exam.

Another group read a statement which explained how physiological responses to stress, such as a racing pulse or sweaty palms, can be beneficial to the exam process.

The control group were told to ignore their anxiety and students in a fourth group participated in both activities aimed at easing exam anxiety.

The results showed that while the process had no effect on high-income students, low income students benefited significantly from the 10 minute exercise.

Of those who undertook an activity, 81 per cent passed from low-income groups. Of students from the same income group who were told to ignore their emotions, only 61 per cent passed.

Of those who undertook an anxiety calming activity, 81 per cent passed from low-income groups. The same income level students who were told to ignore their emotions, only saw a 61 per cent passed rate.
Getting into STEM careers can significantly improve social mobility and even lead to lucrative careers, experts say.

But poor students are less likely to complete four years of science at school and therefore even likely to major in science and math in college, which prevents them going into STEM related professions in later life.

The results of the study suggest social economic disparities could be reduced through simple and short measures effective at controlling student emotions.

Previous research from Stanford University published in 2017 showed that even a 15-minute hack getting students to think about their revision strategy could turn a B+ grade into a strong A.

The study suggests that it’s much more than ability in STEM and how prepared a student is for the exam, emotions are a huge part of academic success in this area.

The full findings were published in the journal Proceedings of the National Academy of Sciences.

How to deal with exam stress

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