

Growth mindset messages can close grade gap for first-generation students

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Just two emails, at the right time with the right message, can make a big difference for students who are the first in their families to go to college.

A recent Washington State University study highlighted the power of an instructors' [growth mindset](#)—the belief that abilities are not innate but

can be improved. Researchers found that when first-generation students in an introductory science course received growth mindset emails after their initial exams, they did better in the whole course than a control group.

On average the students raised their final grade by about a third of a letter grade, such as moving from a C+ to a B-, making their overall performance on par with "continuing-generation" students, whose parents had graduated from college. The findings are reported in the [journal CBE—Life Sciences Education](#).

"It's a pretty sizable effect," said lead author Elizabeth Canning, a WSU psychology researcher. "Many studies have shown that continuing generation students outperform first-generation students, but in the condition where we sent emails from the instructor that had growth mindset language, we saw that difference in performance completely go away."

Canning and graduate student Makita White conducted the study in a large, introductory biology class taught by WSU Professor Bill Davis online in 2021 during the pandemic. The course is considered challenging, and as a prerequisite to many majors, it can determine whether a student continues on to a medical or scientific career.

After the first two exams about 200 students were sent a standard [email](#) telling them that [exam](#) grades had been posted online and reminding them of the professor's office hours. Another 200 students received longer emails after those exams which also contained the professor's growth mindset views.

The messages were based on a theory called "wise interventions," Canning said, meaning they are designed to come at critical times of uncertainty in a student's development. The emails not only emphasized

that improvement in the class was possible even after a low exam grade but also normalized struggling academically.

For example, the professor said he had worked with many students in the past who performed poorly on the first exam but turned things around on future tests, and they did so by figuring out better ways to learn in the course. Then, he gave specific actions they could take, such as forming a [study group](#) or accessing extra resources.

Since the course was taught completely online, the researchers could see if the students' behavior changed following the exams. They found that the students who received the growth mindset messages went to the course website, accessed lecture materials and study notes more often. The first-generation students performed better on the third exam, and ultimately, achieved a better grade in the whole course than the control group.

First-generation college students tend to face a lot of challenges simply because they do not have parents who have university-experience to help them. Other research shows that they tend to ask fewer questions in class and do not access resources, such as attending instructor office hours, as often as continuing-generation students. They also represent about one-third of all college attendees.

"Just for equity reasons, it's important to help first-generation students," said Canning. "But especially in STEM fields, to keep up with medical advances and rapidly changing technology, we need capable students who have a foundation in science, so retaining them is especially important."

Based on the promise of this work, Canning's team plans a larger, national study involving 10,000 students to look at the impact of this type of intervention on minority students.

More information: Elizabeth A. Canning et al, Growth Mindset Messages from Instructors Improve Academic Performance Among First-Generation College Students, *CBE—Life Sciences Education* (2024). [DOI: 10.1187/cbe.23-07-0131](https://doi.org/10.1187/cbe.23-07-0131)

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