

Interactive teaching methods help students master tricky calculus

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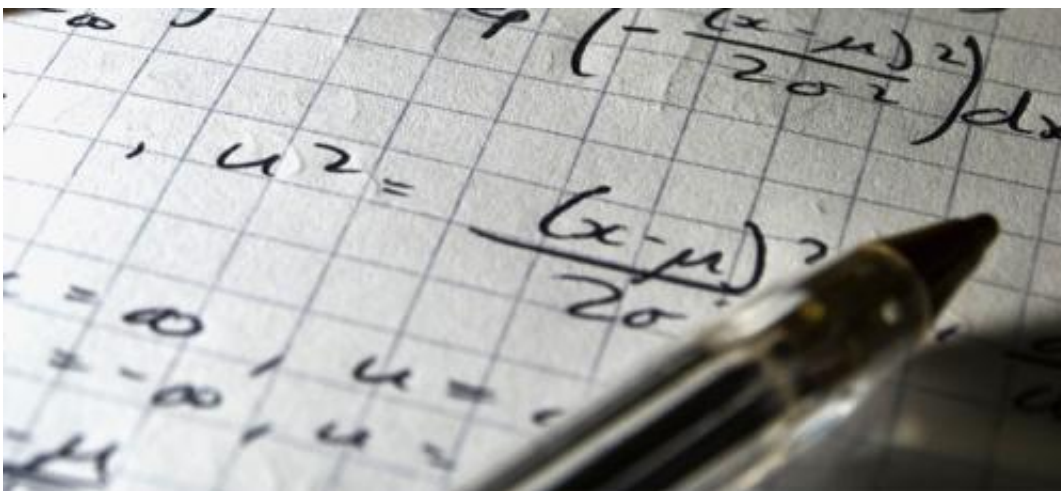


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Pre-class assignments, small group discussions and clicker quizzes improve students' ability to grasp calculus, says new UBC research.

The key to helping [students](#) learn complicated math is to understand how to apply it to new ideas and make learning more interactive, according to a new study by UBC researchers. Pre-class assignments, small group discussions and clicker quizzes improve students' ability to grasp tricky first-year calculus concepts.

Students taught in such active-engagement classes were 10 per cent more likely to understand key concepts on subsequent quizzes, according to

the study published in the *International Journal on Mathematics Education*. This was true even when compared to students in classes already incorporating modest levels of clicker use and interactive discussion. They were also better able to apply their knowledge to new ideas.

"With the right support, you don't need a great deal of instructional experience to introduce the techniques," said UBC mathematician and educational strategist Warren Code, lead author of the paper.

As part of UBC's ongoing efforts to improve undergraduate teaching and learning, Code and colleagues selected two especially difficult topics covered in large first-year calculus classes, and designed week-long 'teaching interventions' to more actively engage students. They then measured the impact on student comprehension of the tricky topics using [quizzes](#) and mid-term exams.

The study compared the performance of two sections, a total of 350 students. The demographics, attitudes and math background of both sections were similar. Each student was only exposed to enhanced active teaching methods for one of the two topics.

"You can't replicate perfect lab conditions in the classroom," says Code. "But we designed the observations so students acted as their own control, and each section outperformed the other on the topic for which it received the intervention. So to the degree possible, we're comparing apples to apples."

Provided by University of British Columbia

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