

Flipping the classroom approach in public health—does student performance improve?

17 April 2018

A study conducted at Columbia University's Mailman School of Public Health analyzed the traditional model of education versus an increasingly popular approach to learning in the health sciences fields—the flipped classroom model—where pre-recorded lectures are viewed outside of the classroom and in-person class time is devoted to interactive exercises, discussions, and group projects. The results showed there were no statistically significant differences in test scores or students' assessments of the flipped classes compared to a traditional lecture course of study. However, students reported that the flipped format allowed for greater flexibility and applied learning opportunities at home and during discussion sections.

The findings are published in the journal *BioMed Central Medical Education*.

"The use of flipped classroom approaches is growing in many health science fields, including [public health](#)," said Silvia Martins, MD, PhD, associate professor of Epidemiology at the Mailman School of Public Health, and senior author. "This blended learning approach is intended to improve classroom learning by allowing students to control the timing and pace of their online learning and maximize their opportunity for active learning by engaging in class discussions and collaborative exercises in the company of their peers and instructors."

Using pre- and post-course surveys, open-ended questions, self-reports of section leader teaching practices, and classroom observations, the researchers compared student examination scores and end-of-course evaluations from 150 Masters-level candidates in the "Principles of Epidemiology" introductory course. Of these, 72 students were enrolled in the course with a traditional format—in-person [lecture](#) and discussion section, and an at-home assignment; and 78 students were part of a flipped classroom format, comprised of at-home

lectures, and in-person discussion sections and assignments.

Compared to attending scheduled in-person lectures, 57 percent of respondents to the end-of-course evaluation found watching video lectures at home to have a positive impact on their time management. Open-ended survey responses indicated a number of strengths of the flipped [classroom](#) approach, including the freedom to watch prerecorded lectures at any time and the ability of section leaders to clarify targeted concepts.

However, 27 percent of students reported the opposite. Negative comments highlighted some of the challenges of a [flipped classroom](#), particularly loss of real-time interaction with lecturers and the perception of the model as a cost-cutting maneuver.

"The video lectures allowed for flexibility, as students could repeat sections they didn't understand for clarification and prepare questions to send to section leaders ahead of time, although the video lectures did make it difficult for students to engage directly with the lecturers," said Stephanie Shiau, PhD, a post-doctoral [student](#) in Epidemiology at the Mailman School of Public Health, and co-first author. "In previous years, the in-person lecture took place right before the in-person discussion section, which didn't necessarily allow for time to process the new information."

To address students' desire to ask questions during lectures, Martins and colleagues are exploring the use of VoiceThread, an interactive software tool designed for online courses that allows for communication through text, voice recording, and video. Students will be able to annotate lecture slides with comments that are visible to section leaders, who can then respond within a short amount of time, and to other students, who may want to contribute to the discussion. Secondly, to

increase the value of the recorded material, a searchable index of the lectures will be created to facilitate students' ability to review key terms and concepts. And, in addition to pre-semester section leader training, an ongoing monitoring system will be established for faculty and staff to conduct regular observations of discussion sections.

Provided by Columbia University's Mailman
School of Public Health

APA citation: Flipping the classroom approach in public health—does student performance improve? (2018, April 17) retrieved 23 September 2020 from <https://phys.org/news/2018-04-flipping-classroom-approach-healthdoes-student.html>

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