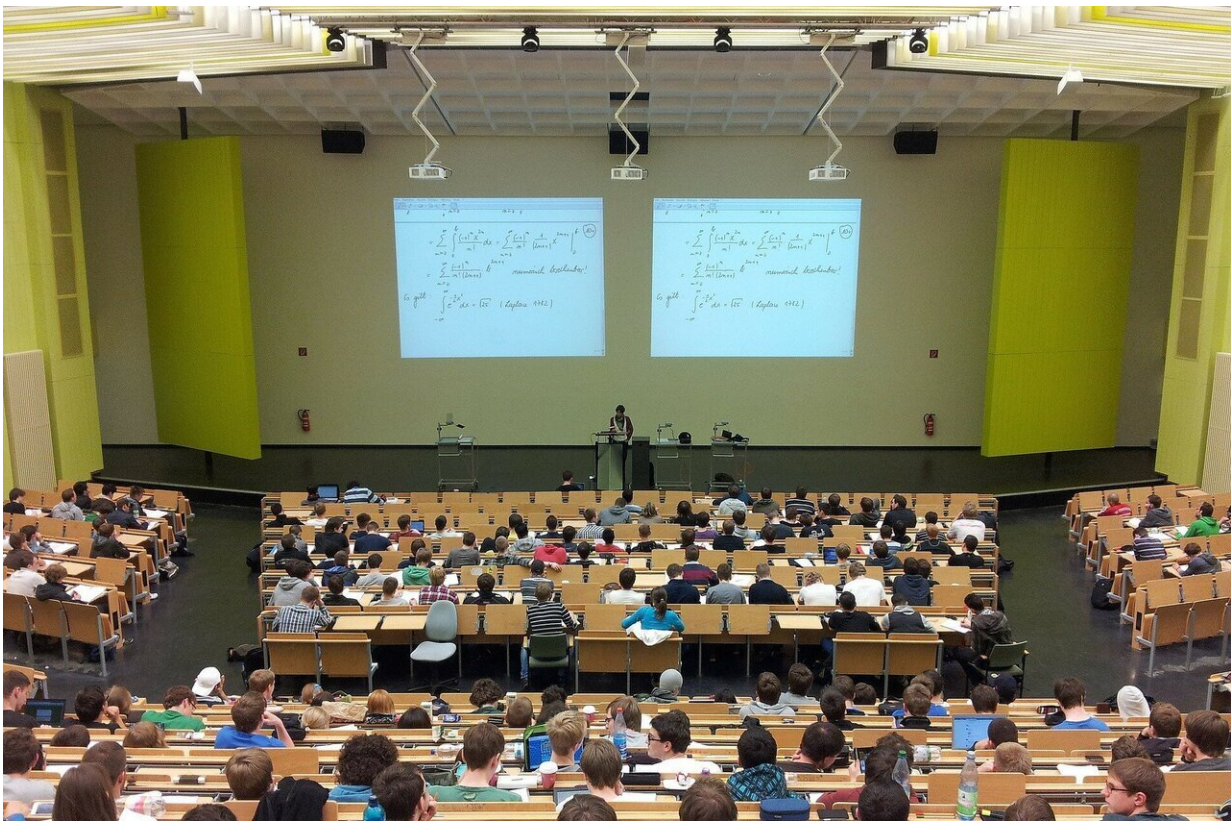# Study reveals key course features that draw diverse students

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Credit: CC0 Public Domain

In a first-of-its-kind study about the impact of online course pages on student enrollment, Cornell researchers found that women are more likely to choose courses with female teachers, but instructors' skin color

did not appear to influence class signups among underrepresented groups.

The field study—of 1.4 million registrations for 159 online courses at 20 institutions—showed that the way courses are presented online is related to participation by historically underrepresented students. Course discipline, stated prerequisites and the presence of gender cues significantly predicted enrollment, the researchers found, while instructor skin color, the linguistic style of course descriptions and references to diversity did not.

"The findings advance our understanding of ways to increase diversity and inclusion in online education," said Rene Kizilcec, assistant professor of information science and first author of "Identifying Course Characteristics Associated with Sociodemographic Variation in Enrollments Across 159 Online Courses from 20 Institutions," which published Oct. 14 in *PLOS One*.

"This research offers clear guidance to instructors and course designers by highlighting the importance of logistical features beyond social features for shaping enrollment diversity, and also identifying features that do not seem to matter much after all, like references to diversity or instructor skin color," said Kizilcec, who directs Cornell's Future of Learning lab. "We are now looking closely at how logistical features are understood by different learners and how we might present them differently to avoid people thinking that a course is too hard for them, or that they don't belong there."

When they first emerged, massive open online courses, or MOOCs, were widely expected to democratize learning, since they were relatively affordable and accessible to people from all backgrounds. But it hasn't turned out that way, with existing inequities replicating in online classes, which provide post-secondary and professional education to 110 million

people worldwide.

Kizilcec and others have studied how to make online courses more accessible and appealing to learners from underrepresented groups. But this study, he said, is the first to systematically examine how the various features of course enrollment web pages influence prospective students in terms of their age, gender, educational attainment and socioeconomic status.

"We took stock of the many features presented on course pages, which are standardized across course platforms, to understand how they vary across courses," Kizilcec said, "and how that variation correlates with who enrolls in the course."

Using the Stanford Online and edX educational platforms, Kizilcec and co-author Anna Kambhampaty '19 identified 40 visual or verbal features on enrollment pages, ranging from the images of instructors to language used in the course descriptions.

"When someone is thinking about taking a course and they're looking at the course page, and they come across a visual or verbal feature that throws them off in some way, they may worry that they won't feel comfortable in the course environment, or their abilities will be undermined," Kambhampaty said. "That right there will stop them from taking the course in the first place. And those are the features we tried to identify."

The researchers used anonymous course enrollment data to test 12 hypotheses, including whether courses with descriptions that express more joy have higher levels of female enrollment; whether courses with prerequisites have lower rates of female enrollment; and whether courses with higher weekly requirements have higher or lower enrollment from less-developed countries.

Among the findings that held true across both the Stanford and edX platforms:

- Women are less likely to sign up for STEM classes, but more women enroll in all types of classes if there is a higher number of female instructors;
- More women enroll in courses without prerequisites and those that demand less weekly effort;
- Enrollment is higher among people from developing countries for courses with prerequisites and more weekly effort;
- STEM courses and courses requiring more weekly effort tend to attract younger students.

"Sometimes instructors take pride in their courses being hard, but that might be misplaced in this environment," Kizilcec said. "It might be better to make courses sound more accessible. Instructors could rephrase information about prerequisites and weekly time requirements to be more inclusive."

The edX data was shared through Cornell's participation in the edX Research Data Exchange program, which facilitates research among partner institutions.

  More information: René F. Kizilcec et al. Identifying course characteristics associated with sociodemographic variation in enrollments across 159 online courses from 20 institutions, *PLOS ONE* (2020). DOI: 10.1371/journal.pone.0239766

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