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Can Online Delivery Increase Access to Education?

Enrollment Status and Online Program Admission

Spring 2014 OMSCS* applicants enrolled in any education program by fall 2016



*OMSCS: Online Master of Science in Computer Science


Source: Researchers' calculations using Georgia Tech and National Student Clearinghouse data

Georgia Tech results suggest that online programs could significantly increase the production of master's graduates in computer science.

Online coursework has been heralded as potentially transformative for higher education, but little is known about whether it increases the number of people pursuing education or simply substitutes for existing options. In **Can Online Delivery Increase Access to Education?** (NBER Working Paper No. 22754), [Joshua Goodman](#), [Julia Melkers](#), and [Amanda Pallais](#) provide the first evidence that online education can expand access to students who would not otherwise have enrolled in an educational program. They study the earliest educational model to combine the inexpensive nature of online education with a degree program from a highly-ranked institution.

In spring 2014, the Georgia Institute of Technology's Computer Science Department started enrolling students in a fully online version of its highly ranked master's degree. The Online Master of Science in Computer Science (OMSCS) costs about \$7,000, less than one-sixth the price of its in-person counterpart. The OMSCS degree is not labeled "online" and is in name fully equivalent to the in-person degree. Georgia Tech designed OMSCS such that its courses are online versions of the same courses in-person students take, designed by the same faculty and graded using the same standards.

The researchers document very high demand for OMSCS, now the nation's largest computer science master's degree program, particularly from mid-career Americans who do not appear interested in the in-person version. Some 80 percent of those admitted to the online program enroll, suggesting few find compelling alternative educational options.

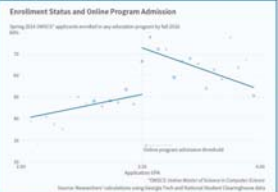


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January 2017

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What Online Education Has Meant for Students and Institutions



The Competitive Effects

Does competition from virtual schools make that brick-and-mortar counterparts better? In *The Competitive Effects of Online Education* (NBER Working Paper No. 22749), David J. Doning, Michael L. Lovenstein, and Richard W. Patterson explore that question by analyzing the impact of online education on colleges with low-selective admission policies.

What they learn both confirms and contradicts their hypothesis. They find that per pupil spending increases at public colleges at least in response to competition from online education providers. They do not, however, find any evidence of tuition cuts from brick-and-mortar institutions.

As of 2012, 9 percent of all U.S. bachelor's degrees were awarded for online study. The researchers investigate the impact of online entry on the behavior of traditional non-selective colleges. They focus on these schools because they are far more likely to draw students from a narrow geographic area than are their more selective counterparts. In 2013, nearly 40 percent of students at selective schools came from out of state, compared with 14 percent at low-selective four-year colleges and less than 6 percent at community colleges.

The researchers work with a sample of 6,782 schools. Roughly one-third of them are public colleges or universities, and just over half are four-year institutions. They use a standard index of market concentration, the Herfindahl Index, to identify geographic regions where nonselective schools face

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To study whether on-line education is just a substitute for an in-person alternative, the researchers exploit the fact that the first cohort of OMSCS applicants faced a GPA threshold that generated quasi-random variation in admission among otherwise identical applicants. Those just above the threshold were roughly 20 percentage points more likely to be admitted than those just below it. Moreover, the authors find that nearly all of those who were just above the threshold, and who were admitted, chose to enroll in OM-SCS. Very few applicants enrolled in non-OMSCS programs. Those just below the admission threshold were no more likely to enroll elsewhere than those just above it, which implies that the online program did not substitute for other educational options. These findings suggest that on-line access substantially increases the overall number of students enrolling, and that the higher education market was failing to meet demand for this online option.

Blind grading of exams suggests OMSCS students learn as much as their in-person counterparts. They also persist at rates substantially higher than in many online settings, with likely degree completion rates between 60 and 90 percent. Such persistence rates among the nearly 1,200 Americans enrolling each year implies OMSCS will produce at least 725 new American master's degrees annually. Roughly

11,000 Americans earn their master's degree in computer science each year, implying this single program will boost annual national production of American computer science master's degrees by about seven percent.

The researchers suggest that online programs using the low-cost, high-quality model highlighted here could tap unmet demand for skill upgrades in other fields. They note that the University of Illinois Urbana-Champaign offers an online version of its MBA, that Yale is developing an online master's degree for physician assistants, and multiple universities in the edX consortium are offering "micro-master's" in various subjects.

"Online education can provide mid-career training without forcing individuals to quit their jobs or move to locations with appropriate educational institutions," they write. They point out that a key unresolved question is the effect of an on-line degree, relative to a traditional degree, on earnings and labor market outcomes.

—Steve Maas

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