IN-DEPTH
DISTANCE LEARNING

THE NEW CLASSROOM?

Will online education make us better students? By Kevin Featherly Illustration by Jesse Lefkowitz

Socrates, perhaps the most noted teacher in all of human history, fairly bragged that he really did not know anything. Twenty-four hundred years later, technology seems to be bringing Socrates' point into focus.

As online learning platforms proliferate, educators are seeing instruction through a new set of digital prisms that alter basic precepts about how people learn. They're grasping the implications of an idea given lip service for generations: Different people learn in different ways and at different rates.

In traditional classrooms, teachers have almost always taught one way—standing in front of a roomful of people, delivering facts and then asking those students to recite those facts back on a test several weeks later. If this approach matched a student's particular learning style, the student likely excelled. If not, well, that's another story.

Computers are different. They're patient. They don't care if a student learns a concept in an hour or in a month. They'll repeat instructions, churn out hints and never get annoyed. They'll collect and crunch data that can be used to redesign and perfect courses right down to the individual level. Was Socrates more aware of the art of teaching than he realized? Have we been getting instruction wrong these past two millennia? Can computers finally help us get it right?
New Alternatives
It might be good to take a step back. For all of its promise, there's little consensus on what makes an ideal online learning environment. And most agree that technology will never fully replace teachers or classrooms.

"There will always be people who would like to go away to college, stay in a dorm with interesting people, have the entire campus social life as well as the learning experiences," says John Mitchell, Stanford University's vice provost for online learning.

Computers clearly provide alternatives that look well beyond the classroom. Stanford Online, for example, aims to serve both its on-campus students and the world at large. It's an incubator and laboratory for digital education where researchers conduct experiments looking for new uses of technology that might lead to new teaching models. It also looks for ways to offer digital course materials to other colleges and universities.

Stanford has provided seed money to some 30 Stanford faculty members and teams to the tune of roughly $25,000 each, according to Mitchell. As a result, Stanford Online has offered 64 online courses since January 2012. Of those, more than 37 have been "massive open online courses" (known as MOOCs), cost-free classes that are open to all, although not offered for college credit. MOOCs are common now, but two years ago Stanford offered the first in this latest wave: a course on artificial intelligence. Millions of people have since signed on for MOOCs through Stanford, Harvard, MIT and numerous other institutions.

"It hasn't been an entirely smooth ride. In an incident that was publicized in The Chronicle of Higher Education in February, one professor stopped teaching his Microeconomics for Managers MOOC course partway through. The professor, who was teaching some 37,000 registered students (roughly 740 of whom were active in discussions), reportedly bailed after criticism from students about the amount of work he assigned and about a required textbook that students couldn't obtain for free."

The class was offered by the professor's school through Coursera, a private online education company cofounded by Stanford computer scientists Daphne Koller and Andrew Ng. Far from demonstrating the failure of MOOCs, Mitchell says the incident reflects the public's "huge, huge interest" in them. "If you're not failing at something, you're probably not trying enough new ideas," he says.

In a brief email exchange in which Koller was not asked about the incident, she suggested that Mitchell was correct about MOOCs' widespread interest, whether offered directly by universities, by Coursera or by other providers such as Udacity, edX and iTunes U.

Since its 2012 launch, Coursera has processed 2.8 million student registrations. It lists 325 courses in its catalog (about 179 of which have launched) and its academic partners that furnish course material include 62 universities, 24 of which are outside the United States.

Koller made her reputation applying artificial intelligence to the biomedical sciences, but she has put her research on hold to devote herself to Coursera. "We want to offer a top-quality higher education to people around the world, for free," she says. "We want to turn education from a privilege of the few to a basic human right."

Tailored to the Student
Western Governors University, a Salt Lake City-based, degree-awarding online university, has crafted an intriguing model. Cofounded and sponsored by 19 U.S. governors, WGU caught the eye of U.S. Secretary of Education Arne Duncan, who has said that whereas such low-cost online models are now the exception, "I want them to be the norm."

WGU caters to working adults (the average age is 37), most of whom have some prior college experience but have not yet completed a degree.
Almost all are looking to education to advance their careers. For most programs, students are charged $3,000 for each six-month term, regardless of the number of credits they take or complete. Assessments at the beginning of a course measure their competency levels, so students can move quickly through material they already know.

In-state students who finish their bachelor’s at WGU finish, on average, after slightly more than three years. Total cost: roughly $7,500—compared to roughly $54,000 (tuition only) for a degree from a state university over five years. WGU enrolled its first student in 1999 and has since awarded more than 20,000 bachelor’s and master’s degrees. It has not raised tuition in five years.

One reason WGU can keep costs low is that it doesn’t develop its own course materials but instead licenses curriculum from Carnegie Mellon University, the lynda.com software-training Web service and many other sources. It maintains only four basic colleges—teaching, business, information technology and health professions—in disciplines where market demand for trained workers is high.

Students are assigned a faculty member who communicates with them every week until they graduate, and each course’s instructor (called a “course mentor”) actively guides students through the material. “So there is this two-pronged mentoring approach that helps students persist and stick with it,” says WGU president Robert Mendenhall.

MOOCs go wrong when they lack this personal touch, Mendenhall suggests. A class comprising of videos of classroom lectures (the content for many MOOCs fails to take advantage of the interactivity of the medium and the ways that it can enhance learning. By contrast, Mendenhall points to a

course that’s part of WGU’s MBA track. Students operate simulated businesses as a computer program tracks their progress over several weeks as they make decisions in an effort to keep their businesses afloat. All the while, students are competing with and getting feedback from their peers.

“If we can ask questions, require interaction and then give students immediate feedback as to whether what they are doing is right or wrong, that is motivating,” Mendenhall says. “And it is very instructionally sound.”

But aren’t the old tried-and-true methods of teaching just as instructionally sound? “The teaching method that’s most tried-and-true—but in our view not as effective—is the lecture,” Mendenhall says. “But that’s how we do education.”

Stanford University president John Hennessy might dispute that statement. Great teaching, he says, takes clear, compelling and enthusiastic presentation combined with student motivation and buy in. There’s a danger that a movement to all-online could produce students who are less engaged and drop out of college at higher rates, he says.

But Hennessy says the online learning medium is making great strides toward warding off that eventuality. “I think we’re learning how to keep that emotional, motivational connection as we deploy more and more online,” he says.

There are few studies gauging the effectiveness of online education, but one in 2007 at Carnegie Mellon University demonstrated compelling results. It found that students in an online statistics course with minimal instructor contact learned a full semester’s worth of material in half as much time and performed as well or better than students receiving traditional instruction over a full semester. In 2010 and 2011, the ITHAKA Foundation conducted studies on that same course, delivered in the same way (but offered at several large public universities) and it got the same results.

Students didn’t simply watch videos or download written assignments, says CampusMooc, who developed the course and who serves as Carnegie Mellon’s Open Learning Initiative director. “They were engaging with the learning activities in the computer interface,” she says. “We did that so that we could give dynamic responses. If students were
stuck, they could ask for a hint."

Michael Horn, executive director of education at the Clayton Christensen Institute for Disruptive Innovation, a nonprofit Bay Area think tank, is an advocate of mastery- and competency-based education. In traditional classroom learning, which Horn dubs the “stand and deliver” model, students move on to new material after a predetermined amount of time. In mastery-based education, they only move on after they’ve mastered the material.

Such learning instills “grit,” Horn says. Students learn the value of sticking with a task through completion because their advancement depends on it. The course in the Carnegie Mellon study differs from Horn’s preferred system in its preservation of time as a pressure factor (students had eight weeks). In Horn’s model, much like WGU, time isn’t a limiting factor. Students try until they succeed.

That same idea could be built into traditional classrooms—if students were infinitely wealthy, colleges had infinite resources and instructors were infinitely patient. But none of this is true. It’s far easier to build it into a digital environment, Horn says. “We can embed assessments and we can scale very reliably and with great functionality across huge populations.”

Mitchell Stevens, an associate professor in Stanford’s Graduate School of Education is the co-convener of Education’s Digital Future, a one-unit Stanford course that each Tuesday brings together graduate and undergraduate students, faculty, local K-12 teachers, software developers, venture capitalists and policy experts for wide-ranging conversations about digital education. EDF is more than a course. “It’s a website, a hub, a potential movement,” declares the Stanford News website. That movement can’t arrive too soon for Stevens, who notes that even as states withdraw funding from
universities and costs of tuition continue to spiral, college is ever more crucial to upward mobility. "Universities are expected to do a lot more with a lot less," he says. "They need to educate more students for a longer period of time with greater efficiency and with clearer measurement than they've ever had to do in the past."

Stevens sees online delivery as one of education's few bright spots. However, its focus needs to broaden, he says. It needs to shift emphasis away from exclusively college-level instruction and include K-12 learners, and it needs to encourage nonacademic options such as DegreeMentor, UnCollege and CodeAcademy, in addition to formal, degree schooling.

In effect, Stevens advocates rewriting the chronology of education. The glide path from K-12 to college—with a high school diploma in between—may not long reflect the way that people best learn, he says.

WMU's Mendenhall has a similar take, suggesting that pressure to change is building from the ground up. As the iGeneration reaches college age, he says, it will make demands of higher education that reflects its own lifelong immersion in online culture.

"The iGeneration isn't comparing universities to each other," he says. "They are comparing them to the consumer experience they are having online. That means that higher education is going to have to provide a much better consumer experience. And, of course, most of higher ed doesn't even want to talk about students as consumers."

"We're going to pull college apart," Stevens vows. "But we are going to come up with new ways to put it back together. That's what we're having a national conversation about. I think it's thrilling."

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