Universities Reshaping Education on the Web

Ramin Rahimian for The New York Times

Daphne Koller and Andrew Ng of Stanford are adding 12 universities to Coursera, the online education venture they founded.

By TAMAR LEWIN

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As part of a seismic shift in online learning that is reshaping higher education, Coursera, a year-old company founded by two Stanford University computer scientists, will announce on Tuesday that a dozen major research universities are joining the venture. In the fall, Coursera will offer 100 or more free massive open online courses, or MOOCs, that are expected to draw millions of students and adult learners globally.

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Even before the expansion, Daphne Koller and Andrew Ng, the founders of Coursera, said it had registered 680,000 students in 43 courses with its original partners, Michigan, Princeton, Stanford and the University of Pennsylvania.

Now, the partners will include the California Institute of Technology; Duke University; the Georgia Institute of Technology; Johns Hopkins University; Rice University; the University of California, San Francisco; the University of Illinois, Urbana-Champaign; the University of Washington; and the University of Virginia, where the debate over online education was cited in last's month's ousting — quickly overturned — of its president, Teresa A. Sullivan. Foreign partners include the University of Edinburgh in Scotland, the University of Toronto and EPF Lausanne, a technical university in Switzerland.

And some of them will offer credit.

"This is the tsunami," said Richard A. DeMillo, the director of the Center for 21st Century Universities at Georgia Tech. "It's all so new that everyone's feeling their way around, but the potential upside for this experiment is so big that it's hard for me to imagine any large

research university that wouldn't want to be involved."

Because of technological advances — among them, the greatly improved quality of online delivery platforms, the ability to personalize material and the capacity to analyze huge numbers of student experiences to see which approach works best — MOOCs are likely to be a game-changer, opening higher education to hundreds of millions of people.

To date, most MOOCs have covered computer science, math and engineering, but Coursera is expanding into areas like medicine, poetry and history. MOOCs were largely unknown until a wave of publicity last year about Stanford University's free online artificial intelligence course attracted 160,000 students from 190 countries. Only a small percentage of the students completed the course, but even so, the numbers were staggering.

"The fact that so many people are so curious about these courses shows the yearning for education," said Molly Corbett Broad, president of the American Council on Education. "There are going to be lots of bumps in the road, but this is a very important experiment at a very substantial scale."

So far, MOOCs have offered no credit, just a "statement of accomplishment" and a grade. But the University of Washington said it planned to offer credit for its Coursera offerings this fall, and other online ventures are also moving in that direction. David P. Szatmary, the university's vice provost, said that to earn credit, students would probably have to pay a fee, do extra assignments and work with an instructor.

Experts say it is too soon to predict how MOOCs will play out, or which venture will emerge as the leader. Coursera, with about $22 million in financing, including $3.7 million in equity investment from Caltech and Penn, may currently have the edge. But no one is counting out edX, a joint venture of Harvard and the Massachusetts Institute of Technology, or Udacity, the company founded by Sebastian Thrun of Stanford, who taught the artificial intelligence course last year.

Each company offers online materials broken into manageable chunks, with short video segments, interactive quizzes and other activities — as well as online forums where students answer one another's questions.

But even Mr. Thrun, a master of MOOCs, cautioned that for all their promise, the courses are still experimental. "I think we are rushing this a little bit," he said. "I haven't seen a single study showing that online learning is as good as other learning."

Worldwide access is Coursera's goal. "EPF Lausanne, which offers courses in French, opens up access for students in half of Africa," Ms. Koller said. Each university designs and produces its own courses and decides whether to offer credit.

Coursera does not pay the universities, and the universities do not pay Coursera, but both incur substantial costs. Contracts provide that if a revenue stream emerges, the company and the universities will share it.

Although MOOCs will have to be self-sustaining some day — whether by charging students for credentials or premium services or by charging corporate recruiters for access to the best students — Ms. Koller and university officials said that was not a pressing concern.

About two-thirds of Coursera's students are from overseas, and most courses attract tens of thousands of students, an irresistible draw for many professors. "Every academic has a little soapbox, and most of the time we have five people listening to us," said Scott E. Page, a University of Michigan professor who taught Coursera's model thinking course and was thrilled when 40,000 students downloaded his videos. "By most calculations, I had about 200 years' worth of students in my class."

Professors say their in-class students benefit from the online materials. Some have rearranged their courses so that students do the online lesson first, then come to class for interactive projects and help with problem areas.

"The fact that students learn so much from the videos gives me more time to cover the topics I consider more difficult, and to go deeper," said Dan Boneh, a Stanford professor who taught Coursera's cryptography course.

The Coursera contracts are not exclusive, so many of its partner universities are also negotiating with several online educational entities.

"I have talked to the provost at M.I.T. and to Udacity and 2Tor," which provides online graduate programs for several universities, said Peter Lange, the provost of Duke University. "In a field changing this fast, we need flexibility, so it's very possible that we might have two or three different relationships."

One looming hurdle is overcoming online cheating.

"I would not want to give credit until somebody figures out how to solve the cheating problem and make sure that the right person, using the right materials, is taking the tests," said Antonio Rangel, a Caltech professor who will teach Principles of Economics for Scientists in the fall. Udacity recently announced plans to have students pay $80 to take exams at testing centers operated around the world by Pearson, a global education company.

Grading presents some questions, too. Coursera's humanities courses use peer-to-peer grading, with students first having to show that they can match a professor's grading of an assignment, and then grade the work of five classmates, in return for which their work is graded by five fellow students. But, Ms. Koller said, what would happen to a student who cannot match the professor's grading has not been determined.

It will be some time before it is clear how the new MOOCs affect enrollment at profit-making online institutions, and whether they will ultimately cannibalize enrollment at the very universities that produce them. Still, many professors dismiss that threat.

"There's talk about how online education's going to wipe out universities, but a lot of what we do on campus is help people transition from 18 to 22, and that is a complicated thing," said Mr. Page, the Michigan professor, adding that MOOCs would be most helpful to "people 22 to 102, international students and smart retired people."

Eventually, Ms. Koller said, students may be able to enroll in a set of MOOCs and emerge with something that would serve almost the same function as a traditional diploma.

"We're not planning to become a higher-education institution that offers degrees," she

said, “but we are interested in what can be done with these informal types of certification.”

A version of this article appeared in print on July 17, 2012, on page A12 of the New York edition with the headline: Universities Reshaping Education On the Web.

140 Comments

Share your thoughts.

1. 

   bgm
   midwest us
2. NYT Pick

   It is a mistake for traditional universities to admit that completing a college course could be seen as something whereby no human interaction has to occur with a professor. This is giving up the entire game right from the beginning. There are thousands, maybe hundreds of thousands, of college faculty in this country. Perhaps, because of technology, huge numbers of them will be made irrelevant and thus become unemployed. There may be nothing that can be done do stop this. But I don't see why traditional universities should be taking the approach of trying to consciously accelerate that process.

   They should be trying to more clearly delineate the value that is delivered to a student when there is human interaction with someone who has done original work in the field they are studying. These benefits go beyond just test results. For example, how does anyone ever discover a motivation to become, say, a research chemist without interacting with one? That was the experience I had in college, and I would not have had it if I had conducted my college career sans any human interaction with a faculty member.

   Well, then also, if things go the way the people in this article would like, there will be very much fewer research chemist also, because most basic scientific research in this country is funded by the government, and the reason the public is OK with that is that these researchers who are funded are faculty members (i.e. also teachers) at universities.

   July 17, 2012 at 7:04 a.m.
   REPLY
   RECOMMEND51
3.
4.
5.

6.

Richard Kiley
Boston
7. NYT Pick

This is great - pace the floor trying to figure out who on God's green earth I will pay for my daughter's college while colleges spend hundreds of millions to give away their content

July 17, 2012 at 7:33 a.m.
REPLY
RECOMMEND11
8.
9.
10.

11.

Anniken Davenport
Harrisburg
12. NYT Pick

Innovation or commoditization? As someone who has been teaching online for over a decade, I can tell ou that what seemed at first an exciting innovation has become quite different. First, we designed courses from scratch, in HTML etc. then came the course programs like webct. Now my college has progressed to D2L - desire to learn.with each change, the course layout becomes more rote, more ladder with education babble (checklists, ruberics, etc) which means the instructor/ course designer has to spend hours finding ways to reinforce the lessons. Meanwhile, students are demanding instant access to the instructor. While a question might have waited until the next classroom session, by which time traditional students may have figured it out themselves in a wonderful aha moment, now the question must be answered now, right now - via text.
Www.valhallapress.com

July 17, 2012 at 8:11 a.m.
REPLY
RECOMMEND28
13.
14.
15.

16.

Sam
VT
17. NYT Pick

The minute that employers begin to accept certificates, or a hybrid of certificates and courses, then the traditional residential college model is going to be in serious trouble.

The bottom line is that the residential college model has built in infrastructure costs that do not allow it pricing flexibility. Knowledge, and the acquisition of knowledge, is not necessarily tied to where one sleeps and exercises (dorms and gyms.)

If a college student today can reasonably expect to make two or three significant career changes in their working lives, what sense does it make to put out a large sum of money at the front end of careers?

Yes, I know: the benefits of a "rigorous" education does have potential benefits for future development and learning. The problem is that they've priced themselves beyond what the market can bear. The payback for this benefit- one that is there but hard to quantify- is increasingly difficult to justify.

July 17, 2012 at 8:34 a.m.
REPLY
RECOMMEND14

Barbara Michel
Toronto ON
NYT Pick

The universities that will offer free on-line courses should be applauded. It is a creative idea whose time has come. It will be interesting to see who uses these courses. It may bring students of all ages to the realization that a university education is a worthwhile pursuit. Those who live in remote areas far from universities may benefit. Such results will be worth celebrating.

July 17, 2012 at 8:36 a.m.
REPLY
RECOMMEND7

Trust
Everyone
NYT Pick

I took the original Machine Learning class with Andrew Ng and now I'm taking an Algorithms class with Tim Roughgarden. The classes have been fairly informative, but I feel like a lot of it really allows people who already have a college education to make leaps and bounds in other subjects. Also, after having completed an MS in engineering, these courses definitely lack the depth

and rigor of the on-campus or distance learning (paid) version whether graduate or undergraduate. Despite these drawbacks, I have found them to be great starting points for deeper study especially considering that I am able to choose freely a great professor and not be dictated the lousy professor who I have no choice to take (encountered plenty of times during undergrad/grad).

What I think would be interesting and potentially disruptive, is if Coursera worked with universities to allow students to blend the existing program with online courses. That way, if your local professor tends to not be good at say viscous fluid flow, computational fluid dynamics, or numerical analysis, a student could find a better professor online who may reside elsewhere but happens to be a more effective teacher, which is considerably more important to me than if they are the next best grant producing researcher.

A la carte education would be amazing. Think about being able to pick and choose the best educators. Why restrain humanity's potential to just those who happen to interact with the best educators?

July 17, 2012 at 8:39 a.m.
REPLY
RECOMMEND10

Kathleen
NH
NYT Pick

It is all very well and good to "not want to pay for that," but as someone who has spent hours and hours developing college courses, reviewing student papers, and writing textbooks, I would like to know how I will get paid for my labors.

In reply to Walker Rowe
July 17, 2012 at 8:52 a.m.
RECOMMEND17

DaDa
Chicago
NYT Pick

Twilight for the universities? Will State U. have departments of 1 professor each (assisted by a technical work force)? Look to the corporate model that already employs an army of underpaid adjuncts to teach massive numbers of students. Since online courses are graded by fellow students, the universities have found a way to cut labor out of the equation and not even adjuncts will be needed. One superstar prof. for every 10,000 students. Can this be a place where knowledge is

created anymore? Or is that conception of the university medieval?

July 17, 2012 at 9:02 a.m.
REPLY
RECOMMEND16

ACW
New Jersey
NYT Pick

TV, of course you're right that the costs are not sustainable and that the model is broken; but the breakage is also at the lower levels.

Credentialism has produced a society in which a college degree is considered by many to be the bare minimum guarantee of basic literacy. Even when I was in college in the 1970s, at a reasonably good private school, I m et some fellow students who clearly were unprepared for college work - people who had to read by sounding out words aloud. (I am NOT exaggerating. I watched one freshman stumble through the preamble to the Declaration - which I could recite from memory. It was painful. Several could not do even simple sums without pencil and paper, and many did not know when the Civil War was or, more than vaguely, why it was fought and by whom.) Yet these kids - admittedly not the majority, but that was 1975 and things have surely gotten worse since - were high school graduates.

Step #1 should be making a HS diploma *mean* something other than that you occupied a seat for a certain number of years and aged out at 18. Step #2 is to reduce college admissions to those who can do, and want to do,college-level work (no party schools, no football schools - school schools). Since the reduced enrolment would undoubtedly decrease the revenue base - maybe not; it would involve fewer scholarships to the unqualified - it doesn't really address the financial issue. But it might be a start.

In reply to Walker Rowe
July 17, 2012 at 9:54 a.m.
RECOMMEND5

checkengine
hanover
NYT Pick

I teach at an Ivy League college and mostly lecture, chalk in hand, though I encourage interruptions. What would I do different for an on-line course? First, I would not make the asides that some students find amusing and interesting. ("Should we really let a guy as young-looking as

Tim Geithner run the US Treasury?") Second, I would not get the feedback from students that sometimes makes me move to a different topic (profs can see bored looks) or backtrack to cover something that I realized was inadequately explained. Third, I could not easily have students introduce themselves to one another so they can get notes if they miss class--but really so they have someone to talk to about the course. In cyberspace, you are pretty much on your own. And that is tough for a 19-year-old whose confidence level has not matured. Seeing that there are other people your age who are struggling with the material is actually pretty helpful, and finding that you can figure it out as well as the next person is a gateway to further accomplishments.