From recession's wake, education innovation blooms

August 4 2013, by Justin Pope

In this Friday, May 24, 2013 file photo, student Raul Ramos goes through his online homework during a session of a massive online class in Madrid. Recent financial pressures and new technologies are opening cracks in traditional, age-old structures of higher education. Terms like "credit hour" and even the definition of what it means to be a college are in flux. Higher education is becoming "unbundled." Individual classes and degrees are losing their connections to single institutions, in much the same way iTunes has unbundled songs from whole albums, and the Internet is increasingly unbundling television shows and networks from bulky cable packages. (AP Photo/Andres Kudacki, File)

On a warm spring evening, hundreds of investment bankers, venture capitalists and geeky tech entrepreneurs gathered near the pool of the Phoenician, a luxury resort outside Phoenix. The occasion? A high-profile gathering of education innovators, and as guests sipped cocktails and nibbled hors d'oeuvres, the mood was upbeat.

Major innovations—forged by the struggles of the Great Recession and fostered by technology—are coming to higher education.

Investment dollars are flooding in—a record-smashing 168 venture capital deals in the United States alone last year, according to conference host GSV Advisors. The [computing power](#) of "the cloud" and "big data" are unleashing new software. Public officials, desperate to cut costs and measure results, are open to change.

And everyone, it seems, is talking about MOOCs, the "Massive Open Online Courses" offered by elite universities and enrolling millions worldwide.

As with so many innovations—from the light bulb to the Internet—the technology is bubbling up mostly from the United States, fueled by American capital chasing profitable solutions to American problems. But as with those past innovations, the impact will be global. In this case, it may be even more consequential in developing countries, where mass higher education is new and the changes could be built into emerging systems.

Many of the 1,500 attendees here— up from a few hundred in recent years—agreed the excitement is centered more in higher ed than lower levels. Global demand is surging. And college tuition dollars—including, in the United States, $200 billion annually in federal student financial aid—follow the students where they choose to enroll, making the market more competitive and open to innovation.

They also agreed on the surprising origins of this spring-like moment: the wintry depths of the financial crisis that struck five years ago.

"People started to say, 'How do we do more with the resources we have?'" said Jim Shelton, the U.S. Department of Education's top innovation guru. "Technology has almost always answered that question for other sectors."

Richard Demillo, director of the Center for 21st Century Universities at the Georgia Institute of Technology, put it another way: The Great Recession exposed structural flaws in higher education. The system simply cost too much and accomplished too little.

"Everything from cost to price to the mission of universities kind of went under the microscope," Demillo said. "Enter technology."

What does this wave of educational innovation entail? To be sure, it includes the MOOCs and all sorts of "adaptive learning" software that promises to teach and measure some things better and more cheaply than a human teacher. The idea is to free up teachers for what they do best, not replace them, advocates insist, though many are skeptical.

But in some ways, the innovation is broader than the technology itself, which many call cool but not yet revolutionary. It's what the technology is doing—breaking down higher education across two dimensions: time and distance.

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degrees are losing their connections to single institutions, in much the same way iTunes has unbundled songs from whole albums, and the Internet is increasingly unbundling television shows and networks from bulky cable packages.

"The consumer, after five years on a tablet and five years on an iPhone, is just sick of being told, 'you can't do that," said Brandon Dobell, a partner at William Blair & Co., an investment bank and research firm based in Chicago. "I can do everything else on my phone, my tablet. Why can't I learn as well?"

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We've been here before. Every new technology promises to transform education.

In the 18th century, the U.S. post office brought correspondence courses. In the 1930s, the big radio networks talked about turning the airwaves into a university for the masses. The Open University, launched in Great Britain in 1971, promised much the same for television. The Internet produced online learning, now 20-plus years old.

All those technologies had some effect. But traditional universities are still around—dominant and expensive. Technology didn't solve the scale problem: One teacher can lecture millions of students online. But truly "teach" them, with personal feedback and interaction?

"There's an endless faith in education in technology," said John Meyer, a Stanford University sociologist of education, and skeptic of the latest trends. "Right now, there's a kind of binge of belief that the Internet will solve the problem."

The arrival of MOOCs, however, in little more than a year, has many

believing this time is different.

At his desk at a telecom company in central Lagos, the Nigerian capital, Ugochukwu Nehemiah used to take his full one-hour lunch break. Now, he quickly devours his meal, then watches his downloaded MOOCs. He's already finished courses in business, energy and sustainability, and (ironically) disruptive innovation, taught by institutions like the Massachusetts Institute of Technology and the University of Maryland.

Nehemiah needs a master's to advance at work, but cannot afford the United Kingdom program where he's been admitted. The MOOC learning doesn't translate into a widely recognized credential. But the teaching is free, not available locally, and helps him even without a credential.

"It's a form of self-development," said Nehemiah, a father of two. "The way I would speak when I have meetings to attend," he added, "would be much different than the way I had spoken if I had not taken this course."

Some MOOCs are only a modest step up from glorified lecture videos. But the star power of famous professors has helped make them hugely popular.

When nonprofit edX offered its first MOOC in "Circuits and Electronics" last spring, 154,000 students from more than 160 countries signed up (though only 8,000 lasted to the final). Now edX has 900,000 students and more than 30 courses. For-profit rival Coursera has 4.1 million students, 406 courses and 83 partner institutions.

The MOOCs, though, are just one part of this new landscape.

Sal Khan, a charismatic former hedge-fund adviser, discovered his knack for explaining things while tutoring his young cousins in algebra in

2004. In 2006, he uploaded his first YouTube video and two years later founded Khan Academy. (One of the formerly struggling cousins just got into MIT).

Today, Mountain View, Calif.-based Khan has more students than all the MOOCs combined : Six million unique users a month from 216 countries watch one of more than 4,000 videos available on Khan Academy's website. These are not full courses, but connected series of free, bite-sized lessons—about 10 minutes each—taught by Khan and others in everything from math to art history.

You can watch in 28 languages, from Spanish to Farsi, Bengali and Portuguese.

The appeal of such technologies is obvious: getting great teachers in front of more—millions more—students.

Yet Khan talks excitedly not just of shaking up education across distance, but time. He says students can learn what they need, when they need it, without having to take and pay for an entire course.

"Whether we're talking basic literacy or quantum physics, it's the ability to cater to one person's needs," Khan said.

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Here's the centuries-old concept of time in traditional universities: Yoke together students of differing abilities, sit them in lecture halls, teach them at the same speed. After 12 or 15 weeks, whether they pass with an A or a D-minus, give them equal credit.

"We've organized higher education into this factory model where we bring a group of students in post-high school and march them through

more or less in lockstep," said Demillo, the Georgia Tech professor, who is also the author of "Abelard to Apple: The Fate of American Colleges and Universities." "People that don't conform are rejected from the factory and people that make it through are stamped with a degree."
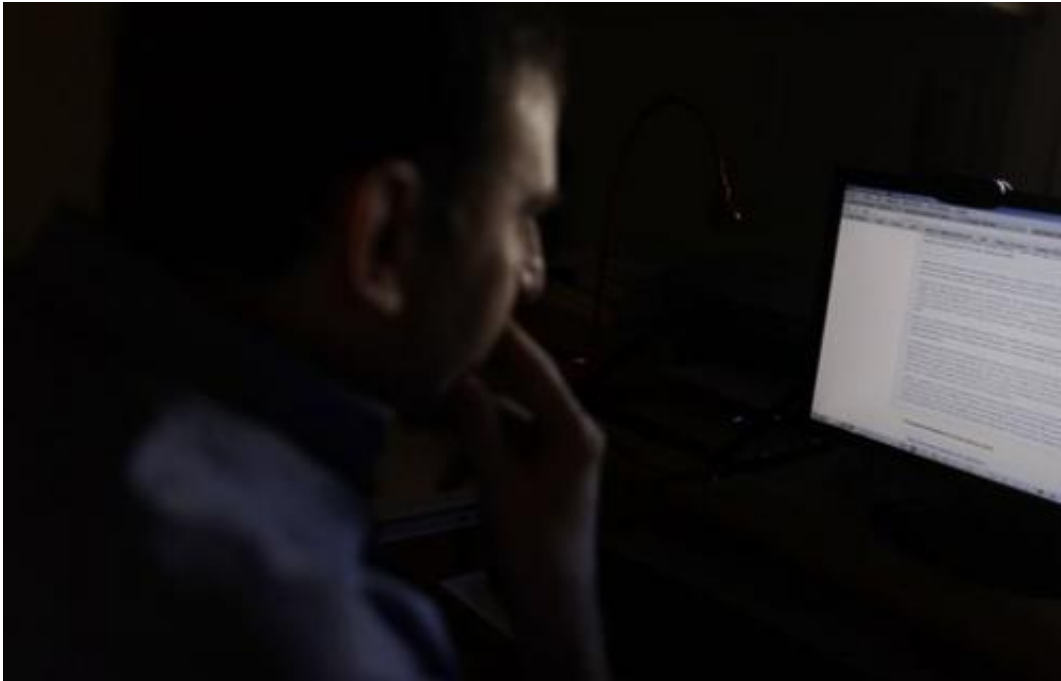
In this Friday, May 24, 2013 photo, student Raul Ramos goes through his online homework during a session of a massive online class in Madrid. Recent financial pressures and new technologies are opening cracks in traditional, age-old structures of higher education. Terms like "credit hour" and even the definition of what it means to be a college are in flux. Higher education is becoming "unbundled." Individual classes and degrees are losing their connections to single institutions, in much the same way iTunes has unbundled songs from whole albums, and the Internet is increasingly unbundling television shows and networks from bulky cable packages. (AP Photo/Andres Kudacki)

Researchers have long understood students generally do better with customized speed and regular assessment, Demillo said.

Such individualized learning was economically impossible. "But technology is a great multiplier just like in business, and it gives you the ability to do that," he said.

At Arizona State University in Tempe, President Michael Crow is also a believer in innovation's ability to improve and scale up teaching—and make better use of time.

Crow practically punctuates his sentences with the word "innovation," and his giant university feels like a laboratory. As he describes it, five years ago ASU was already tearing down department walls, embracing technology in the classroom and re-engineering research across disciplines.

Then the Great Recession's housing bust crushed Arizona's economy, and ASU took a 50-percent state funding cut. Suddenly, it had to push even harder.

"Innovation doesn't occur when you're lying around on the beach," Crow said.

ASU's challenges mirror the country's and the world's. Amid scarce resources, it's trying to accommodate diverse and growing demand.

Unlike virtually any other major American university, it grew substantially through the downturn, expanding from 50,000 students to around 72,000 over the last decade. Completion rates are up, too, so the number of graduates has roughly doubled.

Classroom technology is a part of that. On a weekday morning last spring, a handful of students worked through problems in a developmental math course that looks little like the traditional model. There's no lecturer or blackboard; software takes students through the

material at their own speed, adjusting to their errors. An instructor is available to answer questions—a model that's proven cheaper and more effective than the traditional class.

Yet what matters most here isn't the technology in the room. It's what isn't here: Most students have mastered the material and moved on ahead of schedule.

ASU has broken up the traditional model of two-semesters-per-year into six parts. Some classes have accelerated versions that run essentially at double-speed: six or 7.5 weeks. So students who quickly finish a flexible-time class don't have to wait up to three months before starting a new one. They can move more quickly and cheaply toward their degree.

Meanwhile, those who need the full 15 weeks for a course, or longer, can take it. But ultimately they will probably save time, too. Because the learning technology won't let students move on until they truly master the material, they're less likely to flunk out of the "downstream" classes they advance into.

"We began to say, 'What are all these sacred cows about time?'" Crow said. "What we're looking for is intensification by freeing up the clock."

Some such "innovations" alarm traditionalists who consider education a "seasoning process" that can't be rushed. Crow agrees, but only for part of the education experience. He wants technology to free up faculty resources for upper-division and critical thinking courses where that kind of seasoning and interaction really matter, and for the other endeavors of a physical university.

"Technology cannot produce new ideas," Crow said. "Technology cannot produce new understandings. Technology cannot produce new connections between disciplines."

He's wary of other models that threaten to "unbundle" the college degree entirely from institutions, and disconnect it completely from in-person interaction.

"That's a fatal error," he said.

The factory model has its advantages. Peer pressure—and paying tuition—incentivize students to stick with classes. Roughly 90 percent who sign up for MOOCs aren't completing.

Coursera co-founder Daphne Koller's response to that is that 80-85 percent who intend to complete a MOOC do so. It's just that most don't want or need a whole class. So really, she says, MOOCs actually help solve academia's wasted time problem.

But Koller admits MOOCs can't do everything.

"If you have the opportunity to sit in a classroom with a great lecturer, 12 people around the table having a discussion, then by all means that is the best educational experience you can have," Koller, a former Stanford computer science professor, told a recent conference of education journalists there.

"I'm not trying to substitute that with technology," she said. "But even at Stanford I can't make the claim that students spend the majority of their time in classes with less than 20 people."

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Changing concepts of academic time could have far-reaching effects, on both costs and classrooms.

More than a century ago, the Carnegie Foundation invented the "credit

hour," which became the basic unit of academic time across education, measuring hours spent in class but not necessarily what students learned.

Now, the foundation is reviewing the whole model with an eye possibly toward a more competency-based approach—awarding credit for what students learn, not how long.

The U.S. government is interested, too. In March, the Department of Education approved a competency-based program at Southern New Hampshire University and signaled other colleges could get federal approval for programs that don't mark time in traditional credit hours. Such programs are starting to emerge.

For students who want to move through college quickly, "this has the potential of really changing the cost curve," said Jeff Selingo, editor at large at the Chronicle of Higher Education and author of the new book "College (Un)bound: The Future of Higher Education and What It Means for Students." For others, it could free up time for other important learning experiences—like research with faculty or study abroad.

But change won't come easily. The credit hour is consistent and measurable. Carnegie admits competency-based learning is hugely complex, and it could end up sticking with the credit hour. When 46 countries in Europe recently integrated their system of academic credit, they stayed with a mostly time-based system.

Similarly tectonic shifts may be happening with accreditation—another traditional pillar of American higher education that's been a model for the world, but which technology threatens to transform.

Accreditation, a process essentially run by traditional universities, determines who can award credit and degrees and collect federal

financial aid dollars. It offers a quality control other countries envy. But it's also a kind of self-regulating club that limits competition. To education entrepreneurs who can't give credits or degrees, it's an innovation-squelching monopoly that keeps them from offering their solutions to the problem of college affordability.

The Obama administration said earlier this year it wants more flexibility in the accreditation system, to reward things like value and student outcomes—results, rather than just faculty and physical resources a college provides.

Such developments could open the door to new types of providers. They have entrepreneurs optimistic, though pushing for more.

"The whole monopoly on credentialing is slowly breaking," said Burck Smith, co-founder of Baltimore-based Straighterline, a small start-up with large ambitions.

The company offers online courses (its first ones were self-paced but with tutors available) in subjects like algebra and chemistry. Without accreditation, it can't offer credit itself. But about 40 colleges have agreed to award credit to students who finish Straighterline courses —"unbundling" some of their teaching to a specialized provider.

Students also can't use federal aid to pay for Straighterline courses. But because Straighterline doesn't have a campus, it doesn't charge for things like football teams, student unions and career counselors. It charges only for teaching: $99 a month, a price most can pay without federal aid. It plans to enroll about 15,000 this year.

Some colleges can justify their $50,000 price tag, Smith said. But for students who just want well-taught basic courses, without bells and whistles, why shouldn't the market offer just that?

U.S. Secretary of Education Arne Duncan was asked recently whether he would push for more changes to open up the market. He said he wants to make room for more experiments and to see the data.

"College costs are crushing lots of Americans," Duncan said. "I think technology has a chance, an opportunity, to be very, very disruptive, very helpful there."

"I'm extraordinarily interested," he said. "I'm not sold."

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There's no simple story here. We're headed to a blended world, a partnership between innovators and traditional universities. Each side needs the other.

Students already take Straighterline courses to shorten their time at a traditional college. More than 20,000 classrooms globally use Khan Academy material.

California state universities are offering blended models—MOOC learning materials with onsite help from faculty—and 10 state college systems announced similar plans. California's early experience suggests blended models can be effective, but simply replacing in-person classes with MOOCs is not. Technology alone can't yet achieve the broadest educational goals—especially for students who need more help.

Roughly 40 percent of Coursera's registered students come from developing countries, and close to half of edX's. Most, though, have already managed to get an undergraduate degree. Will other students have the Internet access to take MOOCs, let alone learn effectively from them?

"Disadvantaged populations need higher-touch services, not self-services," said Peter Stokes, an expert on education innovation at Northeastern University.

Abdoulaye Coulibaly, 26, is an English master's student at Felix Houphouet Boigny University in the West African nation of Ivory Coast. He does not believe online education can or should replace the classroom.

"We're going to be very lazy online," he said. "If you put my class online I'm going to take it and I'm not going to come to the university again. We need to come to class. They're the teachers and they have to teach us. If we don't understand, we need to ask questions. That's the only way for us to understand."

And yet, MOOCs have obvious allure in a place where the few universities burst at the seams—if they function at all. Post-election violence recently forced Felix Houphouet Boigny to close for 17 months. Squatters took over the campus, and its libraries still have no books. Just getting to school is an ordeal; Coulibaly must leave his home at 5 a.m. to snag a seat in 8 a.m. class, and he's been robbed a half-dozen times en route. The university has 60,000 students, but is often short classroom space.

To Coursera's Koller, the MOOCs' potential is if anything greater in places like Ivory Coast.

India's latest official 5-year plan calls for increasing college enrollment by roughly 2 million students each year, to help it catch up with emerging economies like Brazil and China. Koller says meeting its goals would require India to build 1,500 new universities—when it can't staff its current ones. Scaled-up teaching through technology is its only hope.

Francisco Marmolejo, a longtime Mexican university administrator who now leads the World Bank's higher education efforts, said governments around the world are intrigued by the MOOCs, but also anxious. Technology's potential to solve the scale problem is obvious. But they fear the MOOCs will become an excuse to ignore the imperative of building local institutions.

Physical universities are "a place where you train to become a citizen," he said. "It is not the new technologies against the old system. It is the blended component that I believe may be the key."

In 1997, Marmolejo noted, the late management guru Peter Drucker predicted big university campuses would disappear within 30 years. He'll almost certainly be wrong about that. The importance of place and human interaction looks, if anything, to have been magnified.

But Drucker may well be proved correct in comparing the scale of the changes coming to higher education to the revolution unleashed by the printing press.

Universities "need to change and they will change," Marmolejo said. "Technology will absolutely help them to change."

  More information: www.coursera.org/ www.edx.org