Essay on what MOOCs are missing to truly transform higher education

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Here's a question I'm asked more and more every day: When is Georgia Tech going to offer an undergraduate engineering degree online?

It's no surprise that this question is being posed. Universities around the country are having intense discussions about massive open online courses, or MOOCs, as they've come to be known.

Late last year, when the Massachusetts Institute of Technology announced MITx, an online learning platform offering free courses for anyone anywhere, Forbes hailed this development as a "game changer" in higher education. Although participants in such courses earn a "certificate of completion" rather than credit or a degree, hundreds of thousands of students around the world have already availed themselves of this opportunity to take online courses from a prestigious university at no charge.

Since then, multiple universities have begun venturing into MOOCs. Stanford, Princeton, my own Georgia Institute of Technology and others have recently signed up to collaborate with Coursera, a new commercial concern with $22 million in venture capital, to provide similar free courseware and instruction. More than 200,000 people to date have signed up for the six courses offered through Udacity, another online entity recently started by Stanford University professor Sebastian Thrun. MIT has now partnered with its Cambridge neighbor, Harvard, and the MITx platform has evolved into edX.

As with any new phenomenon, the experience of change and the promise of benefit create a measure of hyperbole. Some say MOOCs are the future of higher education; others contend they are over-hyped. The truth is no one knows where the exploration of online courses will lead.

What is clear is that colleges and universities must further innovate in a few critical areas if they are to capitalize on MOOCs to their advantage and the people they serve:

Pedagogy. MOOCs offer a huge opportunity to investigate how to use technology to more effectively educate students. They could potentially serve as laboratories to conduct experiments that might reinvent education. How can student learning be optimized in an online environment, and what is the best role of the faculty member in such an environment? Is the "flipped classroom" – i.e., using online lectures as preparation work for in-person interactions at multiple locations – a viable approach?

Scalability. Optimal education requires interaction between student and teacher, and no professor can know 100,000 students in a MOOC. So the model must continue to evolve so that the MOOC becomes one piece of the teaching equation. If credit beyond a "certificate of completion" is to be offered for MOOCs, what models should be developed and tested to evaluate mastery, given that a single professor cannot grade 100,000 exams?

Lab experience. In fields such as engineering or medicine, hands-on laboratory experiences are crucial. But as my friend (and predecessor as dean at Georgia Tech), Don Giddens, has asked: "Would you like to be operated on by a surgeon who earned a degree online?" So higher education must identify the best ways to supplement the virtual experience with the physical experience needed to impart knowledge. Here, we should not ignore the value of simulation environments – after all, pilots learn how to fly in simulators. And again, satellite locations to provide lab experience may be part of the answer.

Cheating. Right now, cheating is virtually impossible to prevent in the online world. In a recent panel discussion on online education, Dave Patterson, who taught a MOOC at the University of California at Berkeley, described technological evidence that indicates such cheating is "unbound." Purveyors of MOOCs will have to develop sophisticated tools and processes to mitigate acts of academic dishonesty.

Until higher education invents solutions that address these areas of concern, the future and value of MOOCs is uncertain. To employers, after all, the credential is paramount; if the credential comes with questions about quality of experience or depth of knowledge, its worth is compromised. This is not to say that Georgia Tech and others are sitting and waiting. We are actively experimenting with – and advocating for – MOOCs to harness their potential. In fact, this fall, engineering and computing faculty will be teaching several classes through Coursera on computational photography, control of mobile robots, computational investing and strategic energy.

A colleague recently reminded me of why we work toward this end when he posted to his Facebook page a quote by W.E.B. DuBois: "The purpose of education is not to make men and women into doctors, lawyers and engineers; the purpose of education is to make doctors, lawyers and engineers into men and women."

A college education is much more than mere knowledge transfer. It is a rite of passage and an important part of personal development and the maturation process. As universities work to assure that result, online courses will no doubt be part of the mix. How much a part
depends on our ability to innovate our way forward.

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