



The Import-Export Paradigm for High-Quality College Courses

An Answer to Tuition's Through-the-Roof Cost Spiral?

Stephen Ruth • George Mason University

Three new free Stanford online courses drew 300,000 applicants in the fall semester of 2011. Might very high-quality courses with the best streaming lectures, student aids, exams, quizzes, mentoring, and so on facilitate an import-export approach to e-learning?

A few years ago in this journal, I discussed some of the ICT-related changes occurring in higher education and described several problems that could be inhibiting e-learning's proliferation.¹ Such obstacles included high administrative and teaching costs, low levels of support for instructional redesign from tenured and other full-time teaching faculty, and a centuries-old model of the university as a place. Here, I examine a significant and increasingly troubling problem – the university structure's inability to achieve unit cost reductions through e-learning interventions.

Skyrocketing Costs

The latest Babson College report (formerly the "Sloan-C Report") updates findings about university administrators' views on e-learning.² This annual survey of provosts and administrators found that two-thirds of those polled regard e-learning as "strategic" and integral to their future progress. Almost one third of all college students use e-learning courses, a 10 percent rise over the previous year, while overall enrollment increased by only 0.6 percent. Finally, 63 percent of administrators and provosts believe that e-learning's outcomes are equal or superior to traditional classroom instruction.

Despite significant increases in e-learning deployment, however, tuition costs have continued to rise – just as they have over the past three decades – at roughly twice the annual inflation rate or more (see http://trends.collegeboard.org/downloads/College_Pricing_2011.pdf). The average loan burden for graduating students is now close to US\$25,000, and aggregate student loan debt has passed \$1 trillion, more than all credit-card debt in the US combined.³ In spite of roughly \$230 billion in annual supplements to higher education – \$80 billion from state and local governments, \$100 billion from federal sources, including tax breaks, loans, and Pell grants, and \$50 billion in R&D funding – the skyrocketing tuition trend isn't going away.⁴

Vance Fried of Oklahoma State University recently completed an analysis of college expenses that included ICT's possible role in reducing them. Like many others who have analyzed this problem, Fried concluded that universities could significantly reduce teaching and administrative costs simply by having instructors teach more students – that is, significantly increasing the student-to-teacher ratio. Given that many universities already offer class sizes of 500 or even 1,000 for selected courses,⁵ a ripe

e-learning target is the large lecture class. Says Fried,

Radical savings through online delivery can be achieved in courses taught in a lecture/exam format, the bread and butter of lower division instruction at public research universities. Some universities are beginning to pursue this approach. It spreads the cost of creating the online lecture over thousands of students, with variable costs per student limited to faculty (often graduate assistants) time spent in responding to email questions and grading.⁶

But this is a relatively easy solution for a specific type of class. What about the millions of other classes taught each year, mostly in the traditional, face-to-face mode? Several significant e-learning innovations could drastically extend a professor's reach beyond traditional classroom confines and dramatically reduce unit costs. Stanford University is pursuing one of the most interesting approaches.

The Stanford Case

During the 2011 fall semester, Stanford offered three computer science courses in e-learning mode for non-matriculated students as well as normal Stanford enrollees. They were free for non-credit students. These weren't simply online, streamed lectures, with notes and a syllabus, such as those available from the Massachusetts Institute of Technology (MIT), Yale, and many other institutions. Rather, the Stanford courses offered everything – homework, graded quizzes and exercises, interaction with the professor (occasionally, through a course mentor), midterm and final exams, and course grades. Incredibly, 300,000 students initially registered for the courses.⁷ For one course, Artificial Intelligence, by the time of the midterm exam, 175 Stanford students were participating, as were 54 from

the University of Freiburg group (discussed next) and approximately 23,000 non-Stanford students, some of whom achieved exam scores similar to the Stanford group's.⁸

In the spring semester of 2012, Stanford will offer six courses in this same format. To make the case even more interesting, the University of Freiburg in Germany offered to proctor exams and give Freiburg students credit for passing Stanford's Artificial Intelligence course (see www.informatik.uni-freiburg.de/~burgard/ai_exams/). Only registered Stanford students received Stanford academic credit for the fall semester classes, but the Freiburg innovation could permanently change this restriction.

world-class instructors and the highest technological production values can attract massive numbers of interested students. Another highly successful and free e-learning approach, the Khan Academy, has benefitted from these same characteristics (see www.khanacademy.org). Second, institutions could work out the credit-granting process via per-student payments to the originating (exporting) institution – in this case, Stanford. Third, other universities importing these courses wouldn't need as many high-level, tenured faculty to mentor or assist students in the learning process. Rather, they could employ graduate assistants or other instructors, and each instructor could probably

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As mentioned, Stanford isn't the only institution offering downloadable, free, high-quality courses. MIT has more than 2,000 courses available in its Open Courseware program – Yale and Carnegie Mellon University also have significant offerings in this format – and recently announced that it would offer some for credit toward a certificate, though not an actual degree.⁹ Until the Stanford breakthrough, these courses didn't offer full services to non-matriculated students, but now that the new approach has been successful, a potentially large import-export market from non-originating institutions seems possible.

Stanford's approach offers several insights about ICT's role in reducing higher education's costs. First, a truly excellent course with

manage several hundred students per semester. Fourth, this import-export model, strongly rooted in lecture-capture technology, could possibly lead to decreases in faculty slots at importing institutions, especially permanent, tenured faculty. Universities would need to preserve positions for research professors who bring in grant funding as well as those whose classes must be taught traditionally, but the opportunity for significant faculty reductions someday could be a game-changer.

Western Governors University

Perhaps the most interesting development during the past decade in restructuring for e-learning is the nonprofit Western Governors

University (WGU). This consortium offers accredited college degrees through e-learning; students concentrate on attaining the appropriate competencies in a particular field, such as education, business, or human resource management. Classes are in normal e-learning format, but students are also expected to pass national or regional competency tests. Most of WGU's student body initially came from western US states, and attendance has risen from 500 in 2003 to more than 25,000 now.¹⁰ Other states have also signed on to the WGU model, most notably Indiana and Texas. The WGU-Indiana program, started in 2010, has already graduated its first class, and has several thousand students.¹¹ The Texas version is just beginning, but it plans

with for-profit, mostly online, programs such as Phoenix, Strayer, and Kaplan, offering lower costs, good flexibility, and none of the taint recently associated with for-profits due to recruiting, loan repayment problems, low graduation rates, and other issues.

The \$10,000 College Degree

Another interesting trend related to the proliferation of competency-based college programs such as WGU is the idea of a \$10,000 college degree. In 2011, Governor Rick Perry challenged Texas to come up with a plan that would accomplish this objective, and the concept has received a surprising amount of favorable comment.¹³ The *New York Times* presented a dozen expert opinions on

that down, not just to \$20,000 but to \$2,000. So yes, place-based activity in that college thing will be five times less important than it is today."¹⁴

Interaction with Students

So, what happens to the relationship between faculty members and students in online courses? Nearly a third of today's college students are already taking at least one course in that mode, so the lack of frequent face-to-face contact with instructors appears to be acceptable, at least for some courses. And being online doesn't necessarily mean being alone. Most online course instructors mentor their students online, and some use Skype and other face-to-face modalities for meetings. Even the Stanford AI courses, with tens of thousands of students, allowed for occasional Q&A through course monitors via email. Nevertheless, most college classes still take place face-to-face, which will likely be the case for a long time. But for students who don't mind doing more knowledge acquisition in cyberspace, e-learning is a useful and convenient alternative.

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to follow a similar approach, offering dozens of programs and low tuition.¹²

WGU has several characteristics that seem to guarantee its future success. It offers dozens of fully accredited degree programs and a clear path for completion. Its cost is considerably lower than a typical public university's. Students can take as many courses as desired for roughly \$3,000 per six-month period, so for around \$20,000, they can start from scratch and finish a full degree program in less than four years (including summers). Most WGU matriculants are older students who already have some college credit, so WGU lets them fill in missing courses to complete their degrees. Another significant characteristic is that WGU directly competes

the idea, and while some were supportive, all argued that the university system as currently configured would have to change considerably, in Texas and everywhere else, if this were ever to succeed. If this sounds unattainable, the *Chronicle of Higher Education* once quoted Bill Gates as saying that even \$10,000 is too much for a college degree if ICT is employed effectively:

"After all, what are we trying to do? We're trying to take education that today the tuition is, say, \$50,000 a year, so over four years — a \$200,000 education — that is increasingly hard to get because there's less money for it because it's not there, and we're trying to provide it to every kid who wants it," Mr. Gates said. "And only technology can bring

Additional Opportunities to Leverage ICT

In what other ways can ICT and e-learning contribute to lowering tuition costs? Probably the most significant opportunity is capitalizing on radical course redesign, especially for subjects that use most of the current higher-education resources. A small percentage of courses account for about a third of all undergraduate teaching hours.¹⁵ A fully proven and validated approach already exists for redesigning such courses, one that's shown results in hundreds of implementations over the past decade. The US National Center for Academic Transformation (NCAT) works with colleges and universities to transform high-volume courses that are taught via traditional lecture. Each approach is different,

but significant e-learning intervention is usually involved, along with redesigning the actual teaching materials.¹⁶ The results have been significant and enduring. The latest report on NCAT shows that many interventions resulted in both higher student achievement and lower unit costs, sometimes amounting to 30 percent or greater improvements. For example, two redesigned English Composition courses at Ohio State and Brigham Young universities showed an average savings of \$60 per student for 6,000 students (see www.thencat.org/PCR/R3Savings.html). Still, over 10 years, only a few hundred courses have adopted NCAT's redesign, many with considerable success. The obvious question is, "Why isn't this proven approach sweeping across the US?"

The answer is complicated, but is undoubtedly related partly to permanent faculty's reluctance to become involved in distance learning. One study found that faculty are still skeptical of most e-learning tools and techniques, including collaboration software (only 31 percent support), virtual learning (35 percent), streaming lectures (20 percent), and e-readers (6 percent).¹⁷ The 2011 Babson Report found that "less than one third of chief academic officers believe that their faculty accept the value and legitimacy of online education. This percent has changed little over the last eight years"² Clearly, faculty resistance is a significant obstacle that universities must overcome before the online education approach can truly take off.

Other challenges must also be considered. The quality of e-learning offerings varies considerably from institution to institution. Also, there is reason to doubt that simply switching from face-to-face teaching to the online version of the same course will automatically reduce costs. The opposite effect can occur if organizational adjustments don't also occur.

The 10 percent increase last year in e-learning enrollment, while far greater than the overall increase of 0.6 percent, was lower than in previous years, possibly signifying diminishing e-learning support. And for-profit universities, mostly e-learning-oriented, have also been experiencing drop-offs in enrollment, possibly due to some negative publicity that's surrounded that sector over the past year.

What might higher education look like a few decades from now? Will we still see increasing numbers of building projects for new academic facilities? Will the traditional face-to-face approach in the college classroom yield to growing use of virtual communication through teleconferencing and other interventions? The more pressing question is, will tuition continue to rise at over twice the rate of inflation every year? If tuition doesn't come under control, it seems likely that the Stanford examples will become very significant. If the finest content, lectures, courseware, grading, and so on are available online already, for how long can colleges continue to run as if this capability doesn't exist?

Savings are possible in four areas: faculty, administration, new buildings, and organization. If the import-export approach happens, net importing institutions might need fewer tenured faculty slots. Administrators' costs have grown at an even greater rate than those for faculty,¹⁸ so the reduction in faculty expenses could be matched in lowered administrative costs. As for academic buildings, most have had the same functions for centuries — classrooms, space for students and teachers, meeting and eating facilities, and so on. If the number of students taking courses in cyberspace is increasing at 10 times the rate of

traditional students, should we really have spent \$12.4 billion on university construction in 2011 (an increase of more than 11 percent over the previous year)?¹⁹ Finally, university organization and management might need an overhaul. At some point in the next few years — if unpaid tuition loans have increased by another \$100 billion, the average student loan burden at graduation rises to \$35,000, and current infusions from state and federal governments drop from the current level of more than \$200 billion — the centuries-old view of the university as a mostly physical place might finally change. When this happens, we'll likely see fewer professors, face-to-face classes, colleges, libraries, buildings, faculties, and departments — many of these will be virtual, as some already are. The good news is that costs to students will be significantly lower as these changes gradually move through academic institutions. We might someday regard Stanford's e-learning success as the game-changing event that significantly altered higher education and made it affordable again. □

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Stephen Ruth is a professor of public policy at George Mason University. He manages a grant-supported IT research center, the International Center for Applied Studies in Information Technology (ICASIT), which studies contemporary technology deployment issues, and, most recently, telework, e-learning, and green IT comparisons between the public and private sectors. Contact him at ruth@gmu.edu.

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