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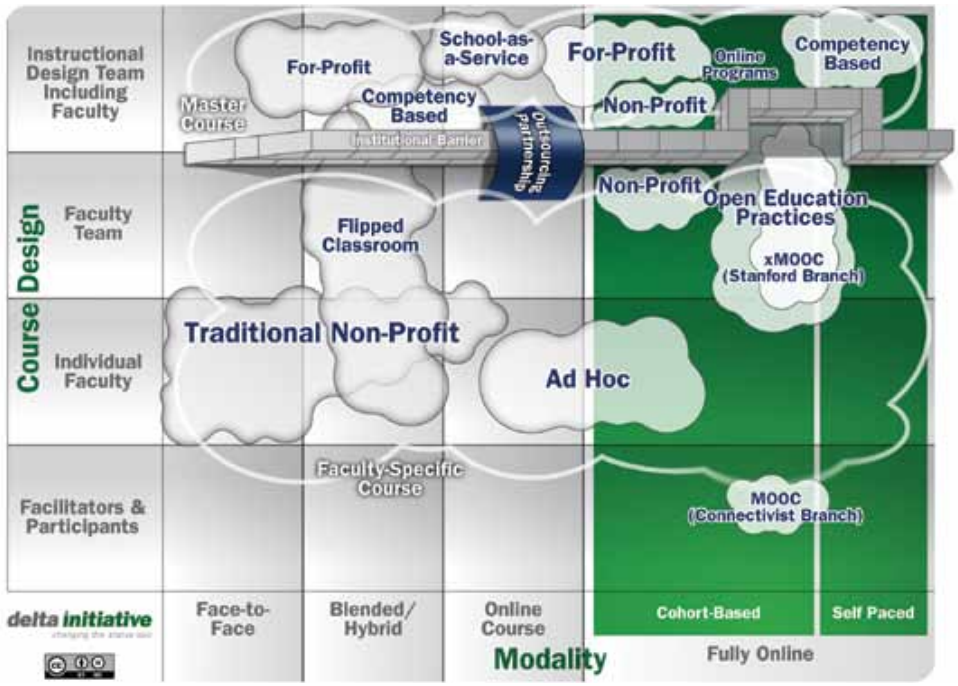
Online Educational Delivery Models: A Descriptive View

By Phil Hill

Although there has been a long history of distance education, the creation of online education occurred just over a decade and a half ago—a relatively short time in academic terms. Early course delivery via the web had started by 1994, soon followed by a more structured approach using the new category of course management systems.[1] Since that time, online education has slowly but steadily grown in popularity, to the point that in the fall of 2010, almost one-third of U.S. postsecondary students were taking at least one course online.[2] Fast forward to 2012: a new concept called Massive Open Online Courses (MOOCs) is generating widespread interest in higher education circles. Most significantly, it has opened up strategic discussions in higher education cabinets and boardrooms about online education. Stanford, MIT, Harvard, the University of California–Berkeley, and others have thrown their support—in terms of investment, resources, and presidential backing—behind the transformative power of MOOCs and online education. National media outlets such as the *Wall Street Journal*, the *New York Times*, and *The Atlantic* are touting what David Brooks has called "the campus tsunami" of online education.[3]

FIGURE 1. Educational Delivery Models, 2012



Unfortunately, a natural side effect of this new interest in education and educational technology is an increase in hype and in shallow descriptions of the potential for new educational models to replace the established system. All too often, the public discussion has become stuck in a false dichotomy of traditional vs. online—a dichotomy that treats all online models as similar and that ignores blended or hybrid approaches. This false dichotomy is even more evident now that discussions are spilling into national media forums. But in fact, as my colleague Molly Langstaff has described, educational technology is interacting with innovative educational courses and programs to create not only new language but also multiple models for delivering education.[4]

As we continue to discuss important issues such as access, affordability, and personalized learning in higher education, we would be helped by having a richer understanding of the changes that are already occurring. I would like to offer a more descriptive view to capture the growing number of approaches enabled by educational technology. The following is certainly not exhaustive, since the field is rapidly changing. In addition, not all of these models will end up thriving in the long term. My intention is simply to describe some of the primary models and ideally to reduce some of the confusion evident in public discussions.

What does this emerging landscape of educational delivery models look like? I have categorized the models not just in terms of modality—ranging from face-to-face to fully online—but also in terms of the method of course design (see Figure 1). These two dimensions allow a richer understanding of the new landscape of educational delivery models. Within this landscape, the following primary models have emerged: ad hoc online courses and programs, fully online programs, School-as-a-Service, educational partnerships, competency-based education, blended/hybrid courses and the flipped classroom, and MOOCs (see Figure 2).

Ad Hoc Online Courses and Programs

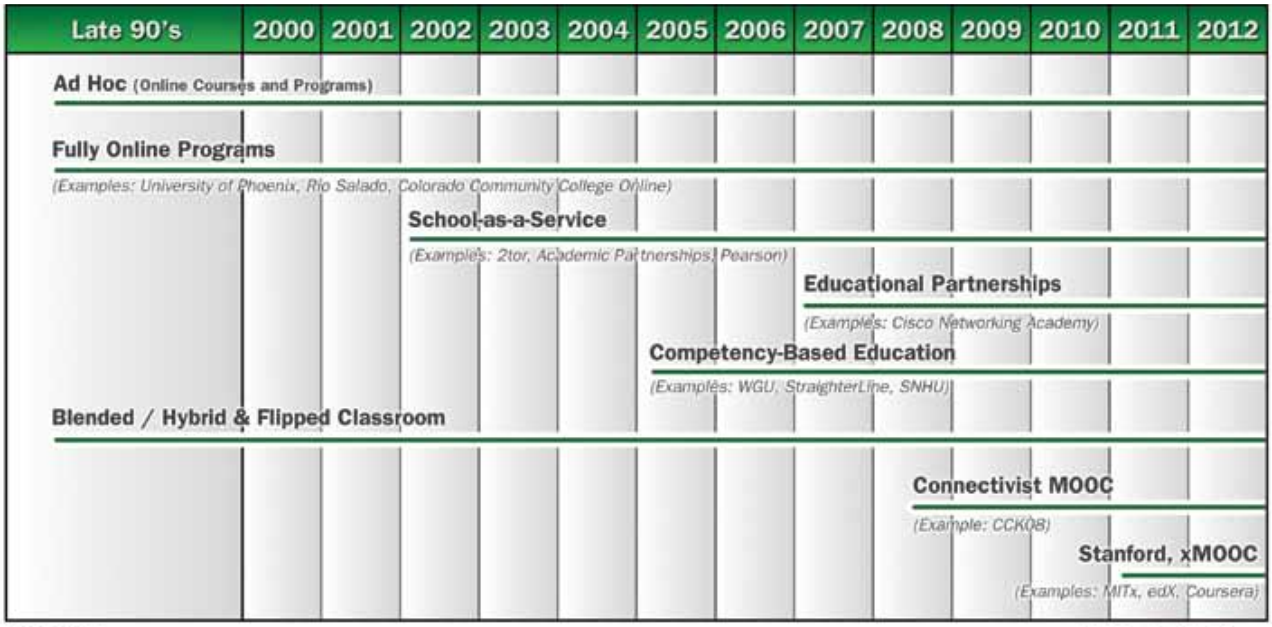
Given the faculty- and department-driven nature of many U.S. postsecondary institutions, the creation of ad hoc online courses and programs—those not based on institutional policy and strategy—is not at all surprising. Due to this ad hoc nature, there are also myriad reasons for the online courses and programs, ranging from faculty exploration of the new medium to the specific needs of particular programs. But many of the ad hoc courses are based on individual faculty members' belief that they are getting better results and learning outcomes using online tools. This is despite most faculty members' skeptical view of the quality of online education. According to a study by *Inside Higher Ed* and the Babson Survey Research Group, fully two-thirds of faculty members say that learning outcomes from online education are inferior compared with outcomes from traditional courses. Still, the report also suggests that the more exposure faculty have to online education, the less fear they have as well.[5]

Faculty members teaching ad hoc online courses are one of the most important yet overlooked sources of knowledge and experience regarding online education. Although ad hoc online courses and programs blazed the trail in what is possible, they are not the primary source for the large *growth* in online education. Furthermore, ad hoc online courses and programs are typically not intended to scale in terms of numbers of sections or students.

Fully Online Programs

The biggest drivers of growth in online courses and enrollment to date have been fully online programs from the for-profit sector and from online-only organizations created by nonprofit institutions. In both cases, these online programs are organized around a concept called the *master course*. This concept of the master course, which changes the educational delivery methods of

FIGURE 2. Primary Models



an institution, is perhaps the biggest differentiator between traditional, for-profit, and even nonprofit fully online organizations.

A master course gets replicated into multiple, relatively consistent sections in a repeatable manner. In this approach, instructional design teams—typically including multimedia experts, quality-assurance people, and instructional designers—work with faculty members and/or subject-matter experts to design a master course. Once designed, the master course sections can be taught or facilitated by multiple instructors, typically adjunct faculty. The faculty members who are part of the design can also be instructors for a couple of sections, but generally the sections are taught by instructors who were not part of the design team.

The master course concept changes the assumptions of who owns the course, and it leads to different processes for designing, delivering, and updating courses—processes that just don't exist in traditional education. The implications of this approach are significant. These differences create a barrier that very few institutions can cross. So, how do institutions that want to provide scale and access deal with this barrier? The most common method over the past decade or two has been to create separate organizations that will implement the master course concept. The majority of for-profit organizations—at least the medium and large for-profits that operate at scale—are based on this concept, whether using online courses or blended/hybrid courses. The largest and best-known example is the University of Phoenix (http:www.phoenix.edu/). In the nonprofit sector, the online organizations typically fit within the overall system of governance, but the operations, budgets, and academic oversight are provided individually. Examples include Rio Salado College, (http://www.riosalado.edu/), University of Maryland University College, (http://www.umuc.edu/), and Colorado Community College Online (http://www.ccconline.org). These organizations often have more in common with their for-profit brethren than with the other institutions within their system.

Many of the failures of traditional institutions or statewide systems to successfully create, grow, and sustain online programs can be traced to organizational resistance from the rest of the system to the separate online organization.

School-as-a-Service

Another approach to overcoming the barrier between traditional education and scalable online education is outsourcing to, or partnering with, an external company for online content, curriculum, and/or student services. These companies bring experience and capabilities to help schools implement a master course concept and the associated operations while providing these courses through the traditional institution.

There is also a burgeoning industry built around outsourced, for-profit service providers—companies that provide the curriculum and course development, as well as the operations, of an online program. This new category is called School-as-a-Service, and some market estimates indicate future compound annual growth rates of 30 percent for this sector. Pearson has entered this market based on the model used with Arizona State University and California State University.[6] Other providers include

EmbanetCompass (http://embanetcompass.com/), 2tor (http://2tor.com/), Deltak (http://www.deltak-innovation.com/), and Academic Partnerships (http://www.academicpartnerships.com/).

Educational Partnerships

An additional promising approach is not well known but has already shown real results. In this model, external organizations provide portions of the online courses and communities of practice, including a network of peer instructors worldwide working in similar programs. The Cisco Networking Academy program (http://www.cisco.com/web/learning/netacad/) is a good example of this model. It has already scaled to serve more than 1 million students, in 165 countries, through more than 10,000 partner institutions. In this model, the educational institution offers the courses within its curriculum, allowing students to pursue industry-relevant certifications and even to use the courses as part of their degree programs. The schools must have or purchase lab equipment, but otherwise the schools benefit from Cisco's decades-plus investment in curriculum, technology platforms, and growing experience with games and assessments. Established in 1997, Networking Academy is Cisco's "largest and longest-running Corporate Social Responsibility (CSR) program," meaning that there is no charge for public and nonprofit institutions. Despite the program's size, the nature of Networking Academy is often misunderstood: it is not a corporate training program but is, rather, a nonprofit educational program.

Competency-Based Education

One of the keys to potential innovation within higher education is to move from credit hours to competency assessment as the definition of whether a course has been completed. Just two years ago, Western Governors University (http://www.wgu.edu/) stood almost alone as the competency-based model for higher education, but today it has been joined by Southern New Hampshire University (http://www.snhu.edu/), the University of Wisconsin System (http://www.wisc.edu/), Northern Arizona University (http://www.nau.edu/), StraighterLine (http://www.straighterline.com/), and Excelsior College (http://www.excelsior.edu/).

What exactly is competency-based education (CBE)? In 2000, SPT Malan wrote about the generally-accepted origins: It is based on the broader concept of outcomes-based education (OBE), which starts with the desired outcomes and moves to the learning experiences that should lead students to those outcomes. OBE can be implemented in face-to-face, online, and hybrid models. In the narrower concept of CBE, the outcomes are more closely tied to job skills or employment needs, and the methods are typically self-paced. In an article from 2000, SPT Malan listed the six critical components of CBE:

- Explicit learning outcomes with respect to the required skills and concomitant proficiency (standards for assessment)
- A flexible time frame to master these skills
- A variety of instructional activities to facilitate learning
- Criterion-referenced testing of the required outcomes
- Certification based on demonstrated learning outcomes
- Adaptable programmes to ensure optimum learner guidance[7]

What is driving the current growth in CBE models? In a nutshell: the desire to provide lower-cost education options through flexible programs. The government, at both the federal and the state levels, is playing a large role. In a speech in November 2011, U.S. Secretary of Education Arne Duncan said of programs such as Western Governors University: "I want them to be the norm."[8] In June 2012, Paul Fain reported on an event attended by Eduardo Ochoa, then the assistant secretary for postsecondary education at the Department of Education. Ochoa stated: "The department is looking to see competency-based education develop and flourish." According to Fain, Ochoa said the Obama administration supports quality competency-based approaches, "which can expand student access while trimming college costs and the amount of time it takes to earn a degree."[9]

At the state level, in June 2012 the University of Wisconsin System and the Office of Governor Scott Walker described their upcoming CBE initiative:

> The University of Wisconsin System (UW) will develop a new, flexible college option, using online instruction and other innovative methods, to deliver the competencies students need at an affordable UW price. . . .
>
> This unique competency-based model will allow students to start classes anytime they like, work at their own pace, and earn credit for what they already know. Students can demonstrate college-level competencies—no matter where they learned the material—as soon as they can prove that they know it. By taking advantage of this high quality, high flexibility model, and by utilizing a variety of resources to help pay for their education, students will have new tools to accelerate their careers.[10]

Blended/Hybrid Courses and the Flipped Classroom

Blended or hybrid courses combine online and face-to-face class time in a structured manner. Although there are varying mixtures of content delivery and interactive activities in this approach, the logical extension is something called the "flipped classroom." The flipped classroom model involves courses that move the traditional lecture, or content dissemination, away from face-to-face hours and into online delivery outside of class time. The face-to-face class time is used for practice and actual application rather than for introducing the content being studied. The instructor then has time to help students face-to-face with

specific problems. Flipped classrooms have been in existence since around 2000, but they have recently been gaining popularity in both higher education and K–12 institutions.

The Khan Academy (http://www.khanacademy.org/), with over 3,400 videos covering multiple subjects, has been a leading force in the popularization of the flipped classroom concept. The Khan Academy videos are free and available to anyone. The most common usage within education circles is for the videos to form much of the online lecture or content-dissemination portion of a course, either replacing or augmenting material from the course instructor. Although Khan Academy videos have mainly targeted K–12 math content up to this point, new revenue investment is leading to expanding content outside of mathematics and into postsecondary-level content.

There are many other examples of blended and hybrid approaches. The common theme is to make face-to-face class time more effective, using it to provide much of the instructor feedback and interactive skills portion of a class while pushing content delivery into more-efficient online tools.

MOOCs

In most of the online educational delivery models of the past decade or so in higher education, the solution to the problems of scale and access has been the duplication of course sections. But as noted earlier, things started to change with the new concept of Massive Open Online Courses (MOOCs). In a MOOC, the course itself is scaled to enable an essentially unlimited number of students to take the course from the faculty members, who both design and lead the course. This design process replaces the master course concept and leverages the natural scaling power of online tools.

MOOCs had their foundations in 2007–2008, in open online courses taught by David Wiley at Utah State University and Alec Couros at the University of Regina. The name MOOC was first used by Bryan Alexander and Dave Cormier to refer to the "Connectivism and Connective Knowledge" (CCK08) course led by Stephen Downes and George Siemens. As described by Downes:

> Many of the ideas that go into a MOOC were around before CCK08 but that course marks the first time the format came together. In particular, we would point to David Wiley's Introduction to Open Education course, which was offered as an open wiki (later called the Wiley Wiki—see https://sites.google.com/site/themoocguide/cck08---mooc-basics) and Alec Couros's open course ECI831—Social Media and Open Education (see https://sites.google.com/site/themoocguide/social-media-and-open-education). These two courses were of course influenced by other work in the field—the concept of open education, in which Wiley was a pioneer, with a license preceding the Creative Commons licenses, the open wiki, which of course was made famous by Wikipedia, and more.[11]

However, it is the Stanford branch of MOOCs, also known as xMOOCs, that has garnered the most press. This branch started with Sebastian Thrun and Peter Norvig's "Introduction to Artificial Intelligence" course in 2011. After the professors offered the course free to anyone in the world, 160,000 people worldwide enrolled. In this type of MOOCs, the educational technology is used to replicate a typical face-to-face classroom experience online, at scale. The Stanford branch of MOOCs includes a course web home, typically on a homegrown customized learning management system (LMS), hosting course lectures, homework, and assessments.

After the success of this course (CS221), Thrun resigned from Stanford and created Udacity (http://www.udacity.com/us), funded by venture capital. At about the same time, other Stanford professors involved in the new movement founded Coursera (https://www.coursera.org/). Soon afterward, MIT and Harvard announced their creation of, and $60 million investment in, edX (http://www.edxonline.org/). In the summer 2012 announcement that the University of California–Berkeley was joining the edX initiative, Chancellor Robert J. Birgeneau stated: "We are committed to excellence in online education with the dual goals of distributing higher education more broadly and enriching the quality of campus-based education. We share the vision of MIT and Harvard leadership and believe that collaborating with the not-for-profit model of edX is the best way to do this. *Fiat Lux*."[12]

In a MOOC, the course itself is scaled to enable an essentially unlimited number of students to take the course from the faculty members, who both design and lead the course.

Given the hype of national media coverage of MOOCs, it is refreshing to see more-recent analysis looking at important attributes such as revenue models, dropout rates, and instructional design. Steve Kolowich, at *Inside Higher Ed*, wrote two revealing articles looking at early demographic data from Udacity, Coursera, and edX. In an excellent article about Coursera's contract with the University of Michigan, Jeff Young, at the *Chronicle of Higher Education*, provided key insights into Coursera's and the university's motivations. Audrey Watters, in response to an article in *The Atlantic*, asked the tough question of whether we should care about the high dropout rates of current courses offered in this new model.[13]

The current generation of courses has proven the feasibility of massive online enrollments, but as Kolowich's article revealed, the result is based on a form of adult continuing education. The majority of students in the Udacity and Coursera courses he analyzed were professionals in the software industry—hardly the target audience for those seeking a change in how we

educate postsecondary students. The current MOOCs provide a nice proof-of-concept, but they do not solve significant educational problems.

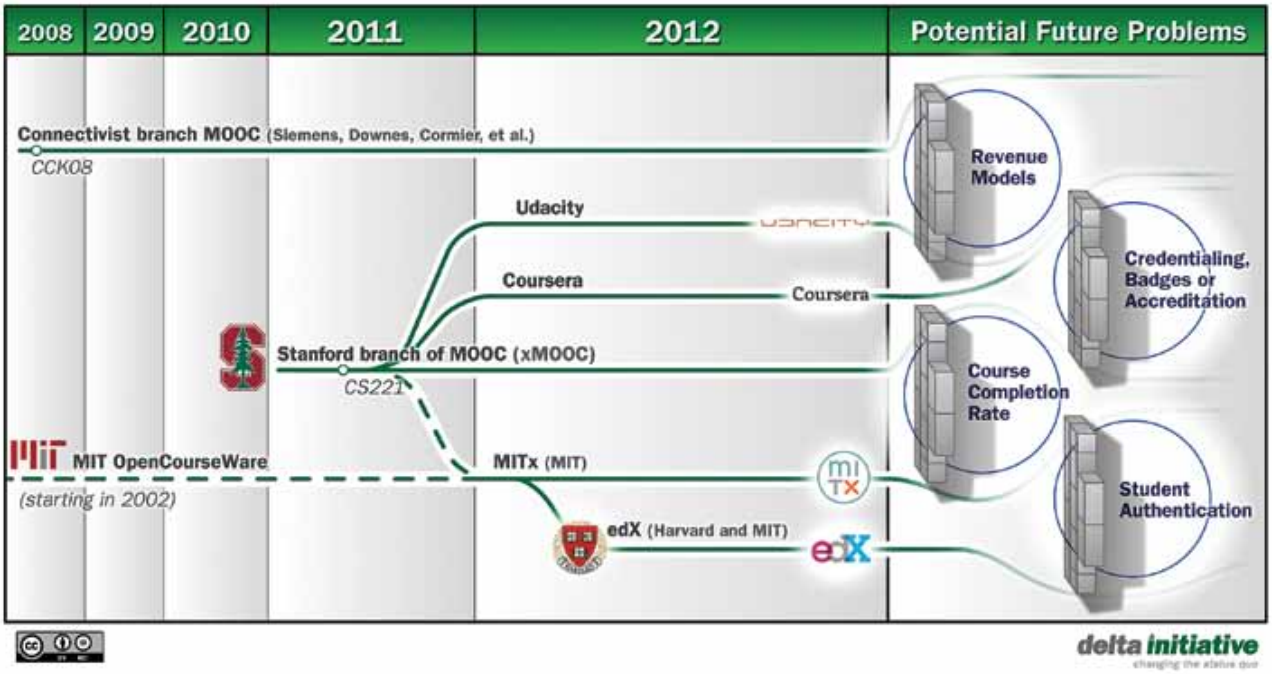
For MOOCs to become truly transformative for higher education, the concept must accomplish the following goals:

- Develop revenue models that will make the concept self-sustaining
- Deliver valuable signifiers of completion such as credentials, badges, or acceptance into accredited programs
- Provide an experience and perceived value that enables higher course-completion rates (in most MOOCs today, less than 10 percent of registered students actually complete the course)
- Authenticate students so that accrediting institutions or hiring companies are satisfied that a student's identity is known

Whether and how MOOCs or successor models can build on current scalability and openness while accomplishing these four goals will be key. For example, the University of Washington is not merely putting courses online with Coursera, it is also experimenting with changes that could lead to real credits. Tamar Lewin reported in the *New York Times*: "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."[14] According to Steve Kolowich, however, this changes the model: "Apart from residing online and on the Coursera platform, these 'enhanced' and potentially credit-bearing courses will hardly qualify as MOOCs."[15]

In the ongoing analysis of the disruptive potential of MOOCs, it is easy to forget that the actual concept is just four or five years old. Furthermore, the definition of the concept itself has undergone a significant change in the past year. The two current branches of MOOCs are early prototypes. Despite their common name, they have different aims and methods. The potential of MOOCs will be based on further developing their techniques. The examples that attempt to tackle the four barriers of revenue, credentials, course-completion rates, and student authentication (see Figure 3) will likely determine the future generation of MOOCs.

FIGURE 3. **MOOCs**



Legitimacy of Online Educational Delivery Models

In early summer 2012, the president of the University of Virginia was forced to resign, at least partially due to the growing legitimacy of and new interest in online education as represented by MOOCs. Although the board's decision process and communications were flawed and the president was eventually reinstated, Tamar Lewin's commentary in the *New York Times* is telling:

> In the end, it seems, the fundamental disagreement at the University of Virginia concerned the approach to change that the president should take—either incremental, with buy-in from each of the constituencies, or more radical, imposed from the top.
>
> Ms. Dragas [Helen E. Dragas, board rector] has displayed a sense of urgency about pushing the university to find new revenue sources.
>
> She has been especially concerned about pushing ahead in online learning, to keep up with Stanford, M.I.T. and other universities that have, just in the last year, begun to offer "massive open online courses," or MOOCs, free to anyone with an Internet connection, carving out new territory in an area that most universities are just beginning to explore.[16]

Perhaps the relevant issue to higher education leaders is not the existence of MOOCs or other forms of online education. Perhaps the relevant issue, undeserved or not, is the legitimacy of online delivery among elite institutions by the very public and financial support of MOOCs and open education in general. The presidents of MIT, Stanford, and Harvard have all publicly and forcefully declared the value and potential of online education. L. Rafael Reif, who became the president of MIT in June 2012, led the development of the MITx project. John Hennessy, the president of Stanford, has publicly supported the "flipped classroom." Drew Faust, the president of Harvard, described how edX would enable the university "to increase access to education and to strengthen teaching and learning" in ways "we could not previously have imagined."[17]

Before six months ago, the biggest and easiest argument against the power of online education was that it would never provide the quality of face-to-face education. This line of argument, self-reinforced by traditional institutions, kept many collegiate presidents and boards from even considering whether major changes were necessary or feasible in higher education. Yet now that elite institutions are publicly extolling the value and quality potential of online education, and are willing to invest tens of millions of dollars, this argument has been delegitimized. The easy fallback position is gone, and presidents and boards are being forced to encourage or lead a much faster pace of change.

Lessons for Traditional Institutions

The recent developments surrounding the growth in online education and the emergence of new educational delivery models lead to four key lessons for traditional higher education institutions.

1. Online Education Consists of Multiple Educational Delivery Models. Each educational delivery model for online education has its own set of

characteristics and goals. It is easy to get caught up in the media hype and throw all models for online education into the same bucket. Although the Stanford branch of MOOCs has been receiving the most media interest lately, it is just one of the recent approaches to online education. In addition, online technology and its associated delivery models will continue to evolve at an accelerated pace, at least compared with the experience of the past decade.

This is a healthy change to the higher education system. Online education should create lower cost structures, and the new educational delivery models universally offer this opportunity.

The new interest in online education brings the added risk that decisions will be made by various groups without a deep understanding of the various models, the technologies, and pedagogical usage. A basic awareness of the potential of the models and the technology trends—not just for today but for the near future—is important for any real benefit to accrue to traditional institutions.

2. *The New Legitimacy of Online Education Can Lead to New Pressures.*
The game has changed. Due primarily to the new legitimacy of online education, traditional college and university cabinets and boards are actively discussing the role of online education in a strategic sense. The past barriers to a wider impact for online education within traditional institutions are crumbling.

As we have seen with the situation at the University of Virginia in June 2012, there may even be significant pressure from institutional boards to develop a cohesive strategy based on the online models. For many schools, it is no longer acceptable to leave it to individual faculty members or departments to decide what, how, and when online courses and programs should be developed. Most institutions will need to determine how online education does or does not serve their specific mission and needs. Online education should now be a considered part of any institution's strategic planning process, even if the decision is to *not* offer online education.

3. *Online Education Should Lower, Not Raise, Student Costs.*
Most of the new educational delivery models are targeted at increased access to education at reduced costs, even at elite institutions. Yet in a 2011 survey conducted by WCET and Campus Computing Project, nearly 93 percent of online programs at traditional institutions are priced at or above the tuition of face-to-face programs.[18] Prior to the recent emergence of new online educational delivery models, traditional institutions felt no pressure to change pricing for these programs, since they were not being sufficiently pressured by a competitive marketplace setting. One of the far-reaching impacts of the new models is that there will be a growing awareness of the potential for online education to lower costs.

This is a healthy change to the higher education system. Online education should create lower cost structures, and the new educational delivery models universally offer this opportunity. It will be increasingly difficult for traditional institutions to justify not having reduced tuition for online courses and programs. Even with no other change, there will be tremendous price pressure for online program costs to drop. In the long run, the higher-priced models could become untenable for all but the most selective universities.

4. *Online Education Will Increase Competition.*
Online education and the associated educational technologies have the potential to play an important role in many traditional institutions that have previously avoided this field. However, online education also increases the ability for institutions to compete with one another and can even help create new institutions.

For example, the (http://www.minervaproject.com/) was funded in 2012 to create a new for-profit university. The concept is to use online education to provide an elite university for students who have the ability to enter Ivy League or comparable schools but who could not gain admission. As highlighted in an article in *The Economist,* in April 2012 Benchmark Capital announced that it would fund Minerva, "which plans to welcome its first class of students in September 2014, to the tune of $25m—one of the biggest seed investments of a leading Silicon Valley venture firm ever. What is more, the new university's advisory board will be chaired by Larry Summers, a former president of Harvard University, and count among its members Bob Kerrey, a former senator and head of the New School in New York, and Pat Harker, president of the University of Delaware and a former dean of the Wharton School.[19]

Although community colleges and other institutions have had competition for students from the for-profit sector, elite research universities and liberal arts colleges have not previously faced the same pressures. We should expect to see more, not fewer, examples of new institutions and new online programs that will increase competition for traditional higher education.

A Bumpy Ride Ahead

The coming five to ten years will be a bumpy ride for traditional institutions. The investment community, particularly venture capital and corporate mergers and acquisitions, have a built-in trial-and-error approach. There will be successes, and there will be failures. Failures are to be expected, and one attribute of investment-based new models is quick failure and quick adaptation.

As a system, higher education is not structured for rapid change, and there will be a battle of cultures as investment-backed educational technology intersects with slow-paced, conservative educational structures. Traditional institutions will likely see more

turmoil, failure, and even successes than they are used to in a short period of time.

Is online education the answer to change in higher education? No. There is no single answer, and online education is not appropriate for all situations. But now that MOOCs have changed the assumptions and the discussions at the executive and board level, complacency or even gradual change is no longer acceptable. That is the real transformative power of the current generation of online educational delivery models. ■

Notes

1. See, for example, William D. Graziadei et al., "Building Asynchronous and Synchronous Teaching-Learning Environments: Exploring a Course/Classroom Management System Solution," *Horizon*, http://horizon.unc.edu/projects/monograph/CD/Technological_Tools/Graziadei.html.
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Phil Hill (phill@deltainitiative.com) is Executive Vice President at Delta Initiative (http://www.deltainitiative.com) and blogs at e-*Literate* (http://mfeldstein.com).