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Challenge and Change

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Early one morning in April 1860, a rider carrying a precious cargo of mail spurred his horse and galloped out of the stables at St. Joseph, Missouri. He would ride for about 100 miles, changing horses every 10 miles, before relinquishing the mail sack to the next rider. That ride began the famous Pony Express, which carried mail from Missouri to Sacramento, California. To create the Pony Express, the business owners hired station masters and riders, purchased and distributed supplies, and built stations with stables across 1,900 miles of the daunting landscape of the American West. The Pony Express was an instant success, reducing delivery time for letters from 22 to 10 days. Yet just nineteen months later, in October 1861, the company was bankrupt, replaced by the transcontinental telegraph. The Pony Express, a colorful and famous service that is well known even now, 150 years later, became the victim of technological change. Today, we would describe what happened to the Pony Express the result of *disruptive innovation,* a term popularized by Clayton Christensen, who has studied industries transformed by technology.

Of course we don't have to go back 150 years to find examples of disruptive innovation caused by technology. Especially in the past twenty years, various industries have been forever altered by technology: newspapers, book publishing, the photography business, and many more. Higher education too faces unprecedented challenges primarily driven by rapid changes in technology. To meet these challenges and adapt to these changes, we need new models.

Six Core Challenges

Six challenges lie at the core of the innovative disruption facing higher education:

1. University Model
2. Structural Model
3. Funding Model
4. Cost Model
5. Business Model
6. Success Model

University Model

The basic model of higher education that exists today was created in the eleventh century, operates on a nineteenth-century calendar, and yet is supposed to prepare students for life in the twenty-first century. Far too often, students are the passive recipients of content delivered by experts who lecture, a practice used since the eleventh century but increasingly inappropriate today. School calendars, created two centuries ago, apparently remain resistant to change. And schools that are supposed to prepare a generation to confront today's challenges far too often fail at that task: only 63.2 percent of students who began college in 2003 earned a bachelor's degree by 2009.[1]

Structural Model

In *The Innovative University,* Clayton M. Christensen and Henry J. Eyring argue that all institutions, no

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matter how they try to distinguish themselves, share a common DNA. This DNA includes face-to-face instruction, faculty self-governance, departmentalization, summer recess, athletics, general education majors, tenure, and externally supported research. Very few institutions are truly distinctive, and far too many have taken on more roles than they can support. Christensen and Eyring conclude that higher education has created confused, multiple-purpose missions and unsustainable institutions and, as a result, is vulnerable to disruption.[2]

Funding Model

For public higher education, the decline of state support has been rapid and catastrophic. In 1986, states provided 77 percent of support per FTE; net tuition was only 23 percent.[3] By 2011, state support had declined to 57 percent, while tuition rose to 43 percent. And in the FY 2012 "fiscal cliff," state support for public higher education declined another 7.5 percent, the "largest decline in state funding of public higher education in nearly a half century."[4] The decline, in part, reflects the fiscal crisis of the nation: 44 states reported budget shortfalls in fiscal year 2012.[5] Though the budgets for states look a little better for fiscal year 2013,[6] the situation has not necessarily improved for higher education. The National Governors Association (NGA) estimates that state budgets will not be balanced until the latter part of the decade and that health, criminal justice, and the K–12 schools will consume an increasingly larger share of the states' resources.[7]

Cost Model

Between 1988 and 2008, the consumer price index rose 75 percent. During that same period, the tuition for public four-year institutions increased approximately 325 percent.[8] That tuition increase is unsustainable. Meanwhile, public concern about colleges is also rising. In 2010, six out of ten Americans said that colleges operate like a business and are focused more on the bottom line than on the educational experience of students. That number had increased by five percentage points in one year.[9] Moody's Investors Service says that there's a mixed outlook for higher education. Tuition levels, it claims, are at a tipping point, with parents and students unwilling to pay more. Moody's analysts note that to remain viable, higher education institutions will have to introduce innovations, including "collaborations between colleges, more centralized management, more efficient use of facilities, a reduction in the number of tenured faculty members, and the geographic and demographic expansion of course offerings."[10]

Business Model

According to the Delta Cost Project, higher education currently represents a set of cross-subsidies: graduate education subsidized by undergraduate education, and upper-division courses subsidized by lower-division courses. Here's the key question: What would happen to the business model of cross-subsidies if (or when) lower-division courses become ubiquitous and virtually free?

This model is unsustainable not only on the revenue side but also on the cost side. A study of instructional costs in public universities in four states found a pattern of spending that favored graduate and upper-division programming. Currently, if the average weighted cost per credit for a lower-division course is 1.00, the cost per credit is 1.42 for an upper-division course, 2.88 for the master's level, and 4.00 for the doctoral level. So institutions spend four times as much to offer doctoral education as they do for the first two years of courses.[11] But guess where the greatest student dropout occurs? In the first two years of college, accounting for 60 percent of attrition.[12] What's wrong with this picture? Colleges and universities are spending all of their money at the highest levels and are seeing all of their failures at the lowest levels. This is more than simply an outdated business model; it's a structural model that cannot be sustained, particularly as more and more students come to college less prepared.

Success Model

In their 2011 book *Academically Adrift: Limited Learning on College Campuses,* Richard Arum and Josipa Roksa found that 36 percent of students of

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traditional college age who were enrolled at four-year colleges and universities "did not demonstrate any significant improvement in learning" after four years, as measured by the Collegiate Learning Assessment (CLA).[13] Furthermore, as the authors noted in a follow-up study, there are real consequences to not doing well on critical thinking tests. Graduates who scored in the bottom quintile of the CLA were three times more likely to be unemployed than those who scored in the top quintile (9.6 percent compared to 3.1 percent), twice as likely to be living at home (35 percent compared to 18 percent), and significantly more likely to have amassed credit card debt (51 percent compared to 37 percent).[14] But Arum and Roksa aren't the only ones finding gaps in student success. According to a 2006 study by the American Institutes for Research (AIR), 20 percent of college students completing four-year degrees have only basic quantitative literacy skills; for example, they are unable to estimate if their car has enough gasoline to get to the next gas station.[15]

Meanwhile, in 2011, student loan debt outpaced credit card debt for the first time and is likely to top one trillion dollars in 2012. The average debt for those with loans is $24,000. That level of debt means that many college graduates will delay getting married, buying a house or car, or having children.[16]

Is Disruption Coming?

Is traditional higher education the next area facing disruption, soon to be radically reshaped or even shut down by competitors using new technologies? Christensen and many others think so. Our university model is antiquated, we have too many similar traditional practices, our funding model depends on increasingly resistant consumers, our costs are rising at a rate greater than health care costs, our business model supports fewer students, and our institutions are not producing more graduates with greater learning outcomes. In 2009, former Ohio State University President E. Gordon Gee proclaimed: "The choice for higher education during this critical juncture is reinvention or extinction."[17] In the coming years, I think we'll see Gee's admonition come to pass, as some institutions redesign themselves and others fail. The greatest challenge for higher education is that reinvention is a three-part problem: We must educate *more* students, with *greater* learning outcomes, at *lower* costs.

Seven Areas of Change

The six core challenges noted above are driven by seven areas of rapid change, primarily technological change:

1. The Players
2. The College Models
3. The Course Models
4. Data and Learning Analytics
5. The Cost: Reduced and Free
6. Measuring Success
7. Threats to the Credential

The Players

Foundations have historically played a large role in higher education, but today, some of the largest foundations—for example, the Bill and Melinda Gates Foundation, the Lumina Foundation, and the William and Flora Hewlett Foundation—are playing a new and more transformative role. Rather than simply giving out grants for projects, these foundations now actively seek to be major influencers on both policy and practice.

In addition to foundations, venture capitalists are beginning to enter the higher education arena. In 2011, for example, venture capitalists spent $429 million to support new education enterprises such as Udacity, Udemy, University Now, Coursekit, Courseload, CourseRank, and Coursebook.[18] The level of venture capital funding promises a bold set of innovative approaches and models; unfortunately, most of those approaches and models will not occur within traditional higher education but will instead emerge as new competitors.

The College Models

New and/or improved college models represent the second area of rapid change. The University of Phoenix, founded in 1976, now enrolls

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approximately 400,000 undergraduate and graduate students. The University of Phoenix and other for-profit providers hold a distinct advantage when competing with traditional higher education: their non-unionized and non-tenured faculty often earn lower salaries and possess lower qualifications than faculty in traditional institutions and typically do not have research obligations. As a result, these education providers can be highly competitive. The current problems they face are lower name recognition and recent negative publicity, but I predict that over time, for-profits will overcome these obstacles.

Perhaps even more interesting is the rise of a set of new institutions with less concern about profits—for example, University of the People, a tuition-free online institution that has accepted more than 1,500 students in over 130 countries. In June 2011, New York University announced that students who had completed a year at University of the People could apply for admission to NYU's Abu Dhabi campus and be eligible for financial aid.[19] Likewise, Peer to Peer University offers a "grassroots open education project that organizes learning outside of institutional walls and gives learners recognition for their achievements." At Udacity, Sebastian Thrun, David Stavens, and Mike Sokolsky believe that university-level education can be both high-quality and low-cost: "We're a growing team of educators and engineers, on a mission to change the future of education." Today there is even the idea of a do-it-yourself university, popularized by Anya Kamenetz's book *DIY U*. In this context, learners will decide for themselves what, when, where, and with whom they want to learn.[20]

Another higher education approach that is growing in popularity is Western Governors University, an online institution that operates on a competency-based model. WGU, created fifteen years ago by the governors of nineteen western states, struggled for a number of years, but today enrolls more than 30,000 students, with institutional offices in Utah. In 2010-2011, WGU Indiana, WGU Washington, and WGU Texas were established by those states through partnerships with WGU.

In addition, some of the better-known traditional colleges and universities are beginning to create new models. Harvard and MIT recently created EdX, investing $60 million to "offer online learning to millions of people around the world for free." Students will not receive university credit but will possibly earn certificates. Meanwhile Coursera has partnered with seventeen (as of July 2012) major research universities: its four original partners (Stanford, the University of Michigan, Princeton, and the University of Pennsylvania) and thirteen additional universities in the United States and overseas. It offers "high-quality courses from the top universities, for free to everyone," with a "wide range of courses from our partner institutions, spanning the humanities to engineering."

A final college model to note is that of the University of North Texas at Dallas. One of the few public institutions that has created an entirely new model for itself, UNT-Dallas offers a narrower set of career-focused majors (e.g., business, information technology, criminal justice), deemphasizes faculty research, operates on a trimester schedule, pays students for some advising and administrative tasks, and reimburses students for their final two trimesters if they graduate in four years.[21] Some aspects of the UNT-Dallas model mirror the descriptions of the evolution of BYU-Idaho, chronicled in Christensen and Eyring's book *The Innovative University*. However, few other existing institutions have taken transformation to this level.

The Course Models

Currently, the dominant course model in the United States is the cottage-industry model. Each course is designed, delivered, and assessed by an individual faculty member. One simple example illustrates the issue. The course Introduction to Psychology ("Intro Psych") is taught in nearly every higher education institution in the United States. If each of these institutions offers four sections of Intro Psych in the fall semester, at the more than 4,000 institutions in the United States, every fall 16,000 separate courses of Intro Psych are being designed, delivered, and assessed—as if this course had never been taught before. Each instructor designs his or her own course from scratch, alone, every semester. By not interacting with other instructors, none of these faculty members learn

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anything about the most-effective course content or most-effective teaching practices outside their own course. In the data-rich and networked world of the twenty-first century, this ancient course model stands in stark contrast to the large-scale courses, the collaborative courses, and the programmed courses that have now begun to appear.

Several institutions model new and different approaches to course design. For example, the U.K. Open University and the University of Phoenix devote huge resources (money and people) to course design, with the courses then taught by a large number of adjuncts in a fairly similar, standard way. An assessment unit then conducts the evaluation of learning outcomes. For their online courses, Rio Salado Community College, Kaplan University, and Drexel University use collaborative course development, significant standardization of course design, careful analysis of results, limited numbers of new courses per year, and revision of courses only once every two to four years.

Recently, for-profit organizations and public or not-for-profit universities have collaborated to deliver specific courses or programs. For example, John Katzman, the founder and Executive Chairman of 2tor, has created a partnership with top-ranked research universities (e.g., the University of Southern California, Georgetown University, the University of North Carolina at Chapel Hill) to develop and deliver high-quality online degree programs. One of Katzman's partners is the Rossier School of Education at the University of Southern California; together, they created an online MAT degree: the MAT@USC. I asked Karen Gallagher, the USC Dean of Education: "Why on earth does USC, with its brand name, deep pockets, and great faculty, need a for profit provider?" She answered: "For three reasons: Katzman's worldwide marketing, a website to die for, and $20 million in venture capital [developed for this one MAT program]."

Another example of the for-profit/not-for-profit partnership involves Academic Partnerships, a privately held for-profit company that works with a number of public and not-for-profit universities. One of Academic Partnerships' first initiatives was created with Lamar University in Beaumont, Texas. The university contracted with Academic Partnerships to provide support for an online Masters of Education program. In the Academic Partnership model, courses typically have 300–500 students, a faculty member serves as the principal designer and lead instructor, and facilitators (one for every 25 students) work with individual students. At Lamar, Academic Partnerships offered the Masters of Education program at a 40 percent reduction in tuition and a 40 percent reduction in time to completion. The first semester, more than 4,000 students signed up, threatening graduate programs across three states.

Finally, some companies offer individual courses. StraighterLine offers single courses for $99 per month plus $39 per course—or the entire freshman year for $999. Blackboard and K-12 Inc. are selling online courses to community colleges.

Data and Learning Analytics

The growing field of data and learning analytics promises to harness information for institutional and student success. The term *Measuring Success* describes a "method of warehousing, organizing, and interpreting the massive amounts of data accrued by online learning platforms and student information systems . . . in hopes of learning more about what makes students successful, then giving instructors (and the platforms themselves) the chance to nudge those students accordingly."[22] Institutions that systematically collect and analyze student data can provide detailed information and analysis for three audiences: institutions, faculty, and students. For institutions, analytics provides information that helps in predicting academic demand, tracking course success, preventing dropout prevention, enabling social integration, and reporting information for state, federal, and accreditor purposes. Analytics also provides crucial information to faculty members about student success, including areas of misunderstanding, level of effort and persistence, and other details about learning. Finally, analytics provides information for students—on course selection, course progress, major selection, and program progress.

My association, the American Association of State Colleges and Universities (AASCU), recently decided

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to map the progress of data and learning analytics to identify emerging best practices. We partnered with Cisco Systems to use Cisco's TelePresence technology to host a three-hour video conference with participants from twelve locations, seeking to identify the most promising work in the United States in data and learning analytics project development. We found a variety of approaches being developed, including Sherpa at South Orange County Community College District; Degree Compass at Austin Peay State University; Course Signals, which was created at Purdue University; MAP-Works, using a system developed at Ball State University; and Rio PACE, developed at Rio Salado Community College. As these new initiatives are beginning to demonstrate, data and learning analytics can offer powerful ways to improve efficiency in administration and student success.

The Cost: Reduced and Free

Recently, as noted above, some of the new college models—e.g., University of the People, Udacity, Coursera—have increased the pressure on public universities' rising tuitions by offering free tuition or free courses.

In addition, the William and Flora Hewlett Foundation launched a bold initiative in 2002 to make high-quality educational materials openly available anywhere in the world through the Open Educational Resources (OER) initiative. The Hewlett Foundation's investment, more than $110 million, has blossomed into a worldwide movement with an estimated 15,000 free online courses. Obviously, these courses vary in quality; nevertheless, very few academics or traditional higher education institutions use these free online courses to reduce the costs to their students or to reduce the costs of their operations.

Textbooks represent another large cost area for students, yet a growing movement suggests that textbooks will increasingly be reduced in cost or offered for free. For example, in 2011, the Washington State Board for Community & Technical Colleges capped the cost of course materials at $30 per course for the 81 highest-enrollment courses. In the spring of 2012, Rice University announced the creation of an initiative to develop free course materials for five common introductory classes.[23] Other universities have also announced free textbook initiatives.

Higher education institutions are experimenting with other ways to reduce costs for students. The University of Maryland recently reduced all degree programs to 120 hours. Other campuses, particularly with impetus from Complete College America, have explored ways to reduce costs by eliminating bottlenecks in the curriculum, incentivizing full-time enrollment, and using summer school and a variety of other strategies to reduce the time to degree completion.[24]

Ironically, all of these efforts to reduce the costs of—or make free—parts of the educational experience are juxtaposed against a context of rapidly rising public university tuitions, further encouraging the growth of alternatives to the college degree.

Measuring Success

The focus on learning outcomes has changed remarkably in the past thirty-five years. When regional accreditors in the mid-1980s first began talking about learning outcomes, they insisted only that institutions develop a set of learning outcomes and work toward measuring them. But in 2005, the Spellings Commission started discussions about greater federal efforts to measure learning outcomes. In 2007, two higher education organizations—the Association of Public and Land-grant Universities (APLU) and the Association of State Colleges and Universities (AASCU)—worked collaboratively to create the Voluntary System of Accountability, using the concept of value-added to determine whether institutions were being successful.

Although value-added may reflect the power of an institution to move students forward, the concept does not, by itself, address the idea of a minimal college-level competency. Concern about minimal competency propelled the Lumina Foundation to create the Degree Qualifications Profile, or DQP, which specifies levels of attainment for associate, baccalaureate, and master's degrees, across five areas of learning outcomes. Lumina subsequently funded a number of projects to test the ability of institutions to use the DQP. Further underscoring the interest in developing

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assessments that test college-level outcomes, the Voluntary System of Accountability has been involved in discussions about including standards of learning as an optional approach to the value-added metric.

Measuring learning outcomes and reporting success is evidenced by new instruments such as the Collegiate Assessment of Academic Proficiency (ACT), the Measure of Academic Proficiency and Progress (ETS), and the Collegiate Learning Assessment (CAE) and by new organizations such as the National Institute for Learning Outcomes Assessment and the New Leadership Alliance for Student Learning and Accountability. As the stakes grow higher—with increased costs for students and parents, greater funding outlays by federal government programs such as Pell, and growing concern about U.S. competitiveness—the focus on student learning outcomes is likely to grow exponentially.

Threats to the Credential

Many of the areas of change noted above alter models, practices, and processes. Some changes may be adapted and used by traditional institutions, whereas others may represent direct competitors. Yet implicit in the narrative of change looms a greater threat. Traditional higher education has historically been protected by a number of important barriers, including the high cost of entry for new competitors, the power of accreditation to define what is and is not acceptable, and the established reputation of recognized traditional brands. However, perhaps the greatest barrier has been the ability of only "licensed" institutions to grant degrees. But what if degrees are no longer critical? The Lumina Foundation argues that its DQP is needed because a college degree tells so little about what someone knows and can do. What if some industries don't want to wait for the DQP to be fully developed? What if some employers start accepting candidates based on certifications, in an expansion of the relatively limited use of certifications (such as the ones issued by Cisco) today? In fact, some employers are already moving in this direction. Burck Smith, StraighterLine founder and CEO, argues that the Collegiate Learning Assessment could serves as a certification of critical thinking skills.[25] Khan Academy offers badges for completion of certain levels of learning. Sebastian Thrun sent the resumes of the 200 top-performing students in his "Introduction to Artificial Intelligence" course (see below) to several Fortune 500 companies. Could credentials, badges, and certifications eventually be recognized as legitimate substitutes for college degrees?

Six New Course Models

So, where do we go from here? We are facing unprecedented, fundamental challenges and are surrounded by dramatic, rapid changes. This is not simply a difficult moment for higher education: it is the dawn of a very different era. The institutions that will succeed—indeed, thrive—in this era will be those that constantly innovate. What, then, are the new models that seem most promising? I will focus here on courses, since they are at the heart of the institution and may represent the beginning steps in institutional transformation:

1. Flipped Courses
2. Open Learning Initiative (OLI)
3. Science Classes
4. Math Emporiums and Other NCAT Redesigns
5. Blended Courses
6. Massive Open Online Courses (MOOCs)

Flipped Courses

In "flipped courses," content is delivered as homework; class time is reserved for collaborating with others, increasing understanding, and addressing misperceptions. The flipped model transforms classrooms from a focus on the delivery of information to interaction and comprehension. Eric Mazur, a physics professor at Harvard University, was an early adopter.[26] But Khan Academy has received most of the recent attention. Khan Academy began when Salman Khan wanted to help his nieces and nephews by creating little video vignettes about mathematics. Khan Academy now has more than 3,200 videos, covering everything from arithmetic to physics, finance, and history. The goal is "to help you learn what you want, when you want, at your own pace."

TED-ED, a new entry in the rapidly growing field of educational videos, creates powerful performances

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from TED talks and other YouTube videos. The flipped course raises a powerful question. With content everywhere, available on demand from almost any kind of device, why are colleges and universities still bringing students together in a traditional classroom?

Open Learning Initiative (OLI)

One of the early projects in the field of online courses was Carnegie Mellon University's Open Learning Initiative, which began in 2002. OLI courses include modern biology, media programming, engineering statics, chemistry, probability and statistics, the French language, speech, and logic. At least two aspects distinguish the OLI courses from many other online courses. First, unlike in the typical cottage-industry model, OLI courses are created by teams, which often include participants such as cognitive scientists, discipline-content experts, scientists who study human-machine interactions, and instructional designers. In addition, OLI courses systematically gather data about student performance and feed that data into course improvement. As a result, OLI courses yield some dramatic results. One experiment tested an accelerated version of Statistics, which was completed in half a semester. Students in the accelerated course learned a full semester's worth of material in half as much time and performed as well as or better than students learning from traditional instruction over a full semester. For institutions interested in this approach, two opportunities seem promising: instructors can use OLI courses in their classes, or institutions can emulate the team idea in their own course-design processes.

Science Classes

Carl Wieman possesses two interesting titles: Nobel Prize winner in physics in 2001 and Carnegie Foundation/CASE U.S. University Professor of the Year in 2004. He currently directs the Carl Wieman Science Education Initiative at the University of British Columbia and the Science Education Initiative at the University of Colorado. Wieman argues that the keys to learning science are reducing cognitive load, addressing beliefs, and stimulating and guiding thinking. In one simple example (from many that Wieman cites), he conducted an experiment with two physics courses. One class was taught by an experienced, highly rated professor who had no training in new cognitive insights in physics education; the other class was taught by an inexperienced professor who did have such training. The result? Students taught by the inexperienced professor learned twice as much as, and had higher attendance and greater engagement than, the students taught by the experienced, highly rated professor. What Wieman demonstrates is that the teaching of science, and other disciplines, needs to be subjected to careful scrutiny and robust research in order to improve learning outcomes for students.

Math Emporiums and Other NCAT Redesigns

The math emporium model, first developed by Virginia Tech, allows more than 500 students to take math courses simultaneously in one place. Virginia Tech's Math Emporium, housed in a former department store, offers a suite of math courses developed by Virginia Tech professors. The computer-based courses allow students to move thru course materials at their own rate, with prompts, reviews, and links to other materials. Carol Twigg, president and CEO of the National Center for Academic Transformation, has called the emporium model the "silver bullet" for higher education. Its three keys to success are (1) interactive computer software; (2) personalized on-demand assistance; and (3) mandatory student participation.[27] Twigg and her colleagues at NCAT not only have spread the emporium model to many other campuses but also have created a series of other redesign models. A number of institutions, with support from NCAT, have transformed large lecture courses on their campuses, with spectacular results including substantial cost savings, increased course completions and retention rates, and higher student satisfaction. Yet there is a cautionary tale here: far too often in this transformational work, only one course is transformed while the rest of the courses at an institution remain largely the same. The NCAT concepts could be applied broadly if institutions are willing to make deep and substantive change to a large number of courses across many disciplines.

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Blended Courses

A *blended course,* sometimes referred to as a *hybrid course,* involves altering a traditional course so that some portion of the course is conducted face to face and the rest is delivered online. A U.S. Department of Education meta-analysis found that blended courses produced better results than either fully face-to-face or fully online courses.[28] Blended learning also represents the entry point to collaboration. In a blended course, a faculty member still see his or her students face to face, but the power of the Internet-delivered instruction provides multiple learning pathways for students, allows more time to be spent on the course content, and offers rich data analytics to help faculty members understand the learning process. As faculty members who teach blended courses start to see the power of the Internet portion of the course, they will become much more open to teaching online courses.

Blended learning also represents a new model in which multiple faculty members can work together on the Internet portion of a course, while each faculty member still teaches his or her own students. In the past model of course design and delivery, the single expert taught in a closed-door classroom (a mysterious black box), reinventing the wheel; the future is a networked world of faculty and students collaborating across time and space. Institutions that want to transform teaching and learning should invest heavily in blended course models.

Massive Open Online Courses (MOOCs)

The term MOOC (Massive Open Online Courses) was coined in late 2008 by Dave Cormier and Bryan Alexander in response to an open online course designed and led by George Siemens and Stephen Downes at the University of Manitoba. The course, "Connectivism and Connective Knowledge," was offered to 25 tuition-paying students; 2,300 other students from the general public took the online class free of charge. Other open online courses were taught by David Wiley at Utah State University in 2007 and Alec Couros at the University of Regina in 2008. But the idea took off in the fall of 2011 when Sebastian Thrun and Peter Norvig, with 200 students enrolled in the face to face course "Introduction to Artificial Intelligence" at Stanford University, decided to offer the course free to anybody in the world. They sent out a single e-mail, and 160,000 people from 190 countries signed up. More than 23,000 students completed the course. By the end of the course, only 30 of the Stanford students were still going to class, presumably because 170 found the online version more engaging. Out of the 23,000-plus course completers, 248 students had a perfect score in the course; none of them were Stanford students. In January 2012 Thrun resigned from his tenured professorship at Stanford to create Udacity, an online-education venture offering free courses.

This past spring, MOOCs became even more popular with the creation of EdX and Coursera, both of which want to provide free MOOCs for the world. I suspect that in the future, students will present their own universities with certificates of completion from MOOCs they took at Coursera, EdX, or Udacity. What will be the institution's response? Reject? Give credit? The question, of course, is what should universities do, if anything, about MOOCs? Should they try to develop their own MOOCs, or is that too expensive an undertaking? How should they use MOOCs in institutional programming? Could an institution build MOOCs into the curriculum, saving time and cost for both students and the institution?

Despite the stories of MOOCs with more than 100,000 students, other MOOCs operate on a much smaller scale. A variation on the MOOC is the "supersized" classroom. For example, John Boyer, a professor at Virginia Tech, taught an introductory course, "World Regions," to 2,670 students. He allowed students to attend in-person or online, communicating via Facebook and Twitter, and he used Skype to bring in world figures to talk with the class.[29] The Virginia Tech model illustrates the power of new technologies to make these large-scale models engaging and effective. Undoubtedly, experimenters like Thrun, with his connections to Google, are developing a whole series of technologies and tools for even more effective MOOCs. The time for experimentation, as well as for careful thinking about policy and practice, is now, before these new

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experiments in large and free classes overwhelm traditional institutions.

Conclusions

Addressing the challenges and the changes in 21st-century higher education must involve more than using new course models. Changing a few courses will not change the university. We have to ask much more fundamental questions. What is a college or university? Is it a designer of learning environments? A facilitator of learning? An aggregator of learning credits? An assessor of learning outcomes? A certifier of degree completion? When many courses are free, and when the degree is being challenged by other forms of certification, what is the role of higher education institutions? What kind of business models work?

The answers to these questions are left for another discussion. Dramatic and even larger changes lie ahead: new business models, new forms of collaboration and partnerships, new ways of ensuring greater student success, and new ways of thinking about the enterprise. Jeff Selingo, who watches this landscape every day as editorial director of the Chronicle of Higher Education, notes that together the challenges, changes, and new course models "portend one potential future of higher ed that's more collaborative, social, virtual, and peer-to-peer—and where introductory courses are commodities offered free or close to free. That vision leaves room for a slice of traditional colleges to compete either by essentially moving down market or by validating such learning by being the gatekeeper at the end by offering capstone, upper-level courses and granting degrees."[30]

Whatever shape institutions adopt in the future, two changes must be at the heart of any substantive transformation. First, we must do a better job of producing learning outcomes. We simply cannot have a system in which more than one-third of students who start college still don't have a degree after six years, or a system in which more than one-third of college graduates have not improved their critical thinking skills. We won't be able to solve the problems of our society or our planet with people who can't think more robustly than that.

Second, the nature of faculty work must change. The model of the faculty member as the designer, deliverer, and assessor of an individual course is eroding. In this new era, some faculty may be specialists in online course delivery; others may be course designers. Some faculty may be MOOC stars; others may spend more time in entirely different faculty roles, supporting student engagement and learning in innovative ways. For some faculty, the change in roles will be a profound loss; for others, it will offer energizing opportunities.

Indeed, the overarching theme of this new age is that within higher education, a profound shift in power is occurring. At the extremes, faculty and institutions have only two choices: innovate or resist. Matt Miller, writing in the *Washington Post* in 2010, captured this idea best, referring not just to higher education but to the country as a whole: "We're in a race between innovation and calcification—between the power of new ideas to lower costs and boost quality, and the power of entrenched interests to protect their habits and incomes."[31] Miller's observation is a wake-up call: are we going to be innovators or resistors?

Can we transform ourselves before we are disrupted? Higher education institutions have a confusion of purposes, distorted reward structures, limited success, high costs, massive inefficiencies, and profound resistance to change. Surviving—indeed, thriving—in this new era is not an issue of technology, even though technology has been a powerful driver of change. Ultimately, the issue for traditional higher education is one of culture. Can we learn to embrace change?

The rules for this new era are easy to state: Examine every practice, every assumption. Be guided by data, not habit. Constantly collaborate. Innovate wherever possible. Develop a welcoming attitude to change. And never be satisfied with the status quo. Following these rules will be more difficult. But disruption happens most often to the unprepared.

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Endnotes:

1. Kevin Carey, "U.S. College Graduation Rate Stays Pretty Much Exactly the Same," *The Quick and the Ed,* December 2, 2010.

2. Clayton M. Christensen and Henry J. Eyring. *The Innovative University: Changing the DNA of Higher Education from the Inside Out.* San Francisco: Jossey-Bass, 2011.

3. State Higher Education Executive Officers (SHEEO), "State Higher Education Finance FY 2011."

4. American Association of State Colleges and Universities (AASCU) State Relations and Policy Analysis Team, "Dynamics Affecting Public Higher Education Financing and Highlights from States' Legislative Sessions in 2012," *State Outlook,* July 2012.

5. Bill Marsh, "Where Budget Gaps, and People, Are Few," *New York Times,* January 22, 2011.

6. Elizabeth McNichol, Phil Oliff, and Nicholas Johnson, "States Continue to Feel Recession's Impact," Center on Budget and Policy Priorities website, May 24, 2012.

7. The National Governors Association and the National Association of State Budget Officers, *The Fiscal Survey of States: Fall 2011.*

8. Donna M. Desrochers, Colleen M. Lenihan, and Jane V. Wellman, *Trends in College Spending, 1998–2008.* Washington, D.C.: Delta Cost Project, 2010, Figure 1, "College Tuitions Continue to Rise," p. 8.

9. John Immerwahr and Jean Johnson, "Squeeze Play 2010: Continued Public Anxiety on Cost, Harsher Judgments on How Colleges Are Run," report prepared by Public Agenda and The National Center for Public Policy and Higher Education, February 2010.

10. Scott Carlson, "Outlook for Higher Education Remains Mixed, Moody's Says," *Chronicle of Higher Education,* January 23, 2012.

11. Sharmila Basu Conger, Alli Bell, and Jeff Stanley, "Four State Cost Study," State Higher Education Executive Officers (SHEEO), September 2010.

12. National Center for Education Statistics (NCES), Beginning Postsecondary Students (BPS) Longitudinal Study, undergraduates only, data provided by Jane Wellman, Founding Director of the Delta Cost Project.

13. Scott Jaschik, "Academically Adrift," *Inside Higher Ed,* January 18, 2011.

14. Richard Arum, Esther Cho, Jeannie Kim, and Josipa Roksa, "Documenting Uncertain Times: Post-Graduate Transitions of the Academically Adrift Cohort" (SSRC), executive summary.

15. American Institutes for Research (AIR), "New Study of the Literacy of College Students Finds Some Are Graduating With Only Basic Skills," press release, January 19, 2006.

16. Tamar Lewin, "Burden of College Loans on Graduates Grows," *New York Times,* April 11, 2011.

17. Paul Fain, "Gordon Gee Says Colleges Face 'Reinvention or Extinction,'" *Chronicle of Higher Education,* February 9, 2009.

18. Nick DeSantis, "A Boom Time for Education Start-Ups," *Chronicle of Higher Education,* March 18, 2012.

19. Tamar Lewin, "Partnership to Further Global Quest by N.Y.U.," *New York Times,* June 8, 2011.

20. Anya Kamenetz, *DIY U: Edupunks, Edupreneurs, and the Coming Transformation of Higher Education.* White River Junction, Vt.: Chelsea Green Publishing, 2010.

21. Goldie Blumenstyk, "Business Advice Meets Academic Culture," *Chronicle of Higher Education,* April 29, 2012.

22. Steve Kolowich, "Technology and the Completion Agenda," *Inside Higher Ed,* November 9, 2010.

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23. Martha Ann Overland, "State of Washington to Offer Online Materials as Texts," *Chronicle of Higher Education,* January 9, 2011; Mitch Smith, "Why Pay for Intro Textbooks?" *Inside Higher Ed,* February 7, 2012.

24. See Complete College America, "Reduce Time and Accelerate Success."

25. Author communication with Burck Smith, February 2012.

26. Craig Lambert, "Twilight of the Lecture," Harvard Magazine, March/April 2012.

27. Carol A. Twigg, "The Math Emporium: Higher Education's Silver Bullet," *Change Magazine,* May-June 2011.

28. U.S. Department of Education, "Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies," September 2010.

29. Marc Parry, "'Supersizing' the College Classroom: How One Instructor Teaches 2,670 Students," *Chronicle of Higher Education,* April 29, 2012.

30. Jeff Selingo, "A Disrupted Higher-Ed System," *Chronicle of Higher Education,* January 26, 2012.

31. Matt Miller, "What Obamanomics Is Missing: Disruptive Innovation," *Washington Post,* September 22, 2010.

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