

NEW GLOBAL ECOSYSTEMS FOR HIGHER EDUCATION
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There is not a monolithic “university” – now or for the future

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Introduction

When I started surveying new ecosystems for higher education in 2008, my modest aim was to find something interesting to say about the state and direction of American higher education. I was accustomed to my American colleagues worrying about the future of our colleges and universities, but there was at that time not yet a national conversation to join that would illuminate the road ahead. I put some of these ideas into book form (DeMillo R. A., 2011), and I was relatively content with having introduced some new vocabulary (like MOOC) into a discussion that I was convinced would be more and more relevant over the coming months and years.

The problems facing American higher education became suddenly acute with a global economic downturn of dimensions that none of us had imagined. What had seemed like distant problems relating to college access, financial sustainability of public and private institutions, economic inequity in the American workforce, and the inability of a growing bureaucracy to make structural changes in the way that postsecondary education was delivered all of a sudden snapped into crisp focus. Problems that I thought would be worked out over a generation became immediate crises as university budgets were sliced, graduates of respectable programs reported that there were no jobs that matched their skills, and a string of highly critical studies uncovered shortcomings in what most people believed was a noble pursuit: the attainment of a college education by middle class Americans.

I became more involved in speaking to organizations and leadership teams who were wrestling with these problems. There was usually a sense of alarm in these discussions but also what I would characterize as healthy doses of skepticism about potential solutions. I was prepared for “80/20 audiences” in which 20% of the people in the room were convinced that doom was just around the corner but the

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vast 80% majority believed that -- whatever problems existed – there was no crisis to be dealt with. I was met instead with 20/80 audiences in which 20% of the audience was completely comfortable with the idea of letting traditional academic processes sort out the difficulties. The reaction of the remaining 80% ranged from concern to full-blown panic.

I felt some comfort in knowing that government officials, private foundations and a fair number of academic colleagues who (unlike me) specialize in higher education policy were beginning to discuss the shape of a “new ecosystem” for higher education that would shake up traditional institutions, government and the vast bureaucracy that surrounds the American academic enterprise.

It had not occurred to me that there were parallel discussions taking place around the world until I was invited to participate overseas in meeting and panels in which small but vocal minorities were raising the same alarms as their American counterparts.

In one particularly memorable instance, I was invited to participate in a panel about the future of accreditation. My host assured me that my role was to raise questions that could not possibly be raised internally – questions that were literally unthinkable. When my turn came to speak, I made what seemed to me an uncontroversial remark about encouraging group work among engineering students so that they could acquire the collaboration skills that I knew were becoming essential to success in global corporations. At that point the president of a local university jumped to his feet and in certain terms condemned my “attempt to undermine student discipline by condoning cheating!” I glanced at my host. He was leaning back in his seat and smiling.

Whatever political, economic and social forces were propelling the definition of a new ecosystem for American colleges and universities, they were clearly not uniquely American phenomena. By 2012, new global ecosystems for higher education were being defined. They were not yet visible to most people, but they soon would be.

American Origins and Global Implication

There is a consensus among knowledgeable observers that American higher education has not been on a sustainable path for perhaps a generation. This comes as a shock to outsiders who look at the excellent institutions whose names appear in annual top rankings of world universities as models to be emulated. It also sometimes comes as a shock to insiders who are not accustomed to thinking about the broad reach that makes up the American system of higher education.

The brand name of American higher education is associated with a relatively few institutions. U.S. Secretary of Education Arne Duncan calls them the “islands of excellence.” As I described in my book *Abelard to Apple: The Fate of American Colleges and Universities*, (DeMillo R. A., 2011) these islands of excellence are less important to the vast majority of college students -- who do not have access to them -- than the system of higher education overall. Unlike their elite cousins, most American institutions of higher education are locked in a system that is anything but excellent.

Here are but a few of the symptoms of a system that is headed for trouble:

1. It is in financial disrepair. As an economic sector, Moody’s regards it as a bad bet. Soaring debt and what former Princeton president William Bowen calls a “cost disease” (Bowen, 2012) have pushed prices beyond the reach of many American households.
2. It has performed poorly for many constituents. Student debt has jumped past credit card debt as a liability for Americans, passing the trillion-dollar mark sometime last year. Many students graduate from college with grade-inflated degrees that are difficult to market and many more fail to graduate at all. The end result is a soaring default rate for student loans.
3. Public confidence in higher education is on the decline. For the first time, the majority of Americans question the value of a college degree. This lack of confidence is evident in decreased overall spending for public universities and declining applications for many private universities. The end result is a spiral in which institutions, unwilling to scale back their missions, either increase debt or decrease quality (or both).

The American model is one in which the handful of elite institutions that can handpick their students become ever more remote and a relatively few less selective public universities absorb the large number of highly capable students who are not selected by the Elite institutions. The remaining institutions fight it out over the rest – a population that consists not only of average students, but adult learners, first-generation college students and recent arrivals.

Higher education in the United States has evolved to accommodate this state of affairs. Access to a college education is one of the pillars supporting American public policy, but access without quality actually makes the situation worse. Quality was supposed to be insured by a factory model of higher education in which raw materials (students) were sorted by age and ability into batches (classes) to receive uniform doses of content (classes, curricula, and majors). Students who did not make the grade were rejected (failed).

There is a growing divide between students who receive a quality education and the majority who -- because of poor preparation, high cost, inadequate budgets, misplaced institutional priorities, or poor teaching -- do not. The system for the majority does not work very well.

It was partially in response to this situation that innovators in Silicon Valley and elsewhere began to use technology to tinker with the very idea of a university education. Salman Khan's "Academy" that offered fragments of classroom lectures in short, attractive, accessible videos, MIT's decision to make its classroom content freely available to anyone in the world with a web browser and last year's explosion of Stanford-inspired Massive Open Online Courses (MOOCs) onto the higher education scene caused some to believe that the entire ecosystem was about to transform itself.

Transforming islands of excellence into a system of excellence is a challenging task that involves the kind of systemic change that universities do not like to make. Although there is widespread agreement that change is needed, there are varied opinions about what that change should look like and how quickly it will come. However, there is a consensus among academic leaders that economic realities will drive structural change and that technology will determine what that change will look like. (Pew Social and Demographic Trends, 2012)

It was therefore totally unexpected that 2012 would see sweeping change in America and – even more unexpectedly – the beginning of a global conversation about the nature and value of universities. Although, I was a participant, I was personally unprepared for the national and international reaction to events that spanned a remarkable fourteen months:

- The launch and rapid adoption of MOOCs by millions of new learners around the world,
- The crumbling of restrictive intellectual property regimes within universities and among commercial publishers,
- The embrace of technology-mediated experimentation by the top research universities (and the largely ineffective responses by internal academic groups that are traditionally and reflexively opposed to change),
- Accreditation for MOOCs sponsored by A.C.E. and the endorsement of "competency-based" assessment by the U.S. Department of Education (Chronicle of Higher Education, 2012),
- Agreements by ten of the largest public university systems in America to use MOOCs for their online courses,
- The sudden availability of venture and start-up funds to fuel innovation,
- The announcement in May 2103 that Georgia Tech would offer for less than \$7,000 a MOOC-based version of its popular M.S. degree in computer science with an expectation that it would enroll upwards of 10,000 traditional Georgia Tech students,
- The daily, blanket coverage of events in higher education by the national media.

Some critics have characterized the forces underlying these events as a (false) choice between traditional (bricks-and-mortar) residential instruction and an impersonal, corporate-sponsored world of computer mediated information delivery. Many more have rejected this view in favor of a more objective evaluation of the new ecosystem:

1. The rapid rise of MOOCs is a metaphor for change not the solution to all of the ills facing higher education.
2. Flipped classrooms, blended learning and the widespread introduction of mastery based instruction are learning experiments that are long overdue
3. MOOC platform providers have created the world's largest education laboratory.
4. The widespread availability of assets that had been previously hidden (online courseware, social network inspired networks of mentors and assistants, open textbook and other learning objects, openly sharable technological improvements and functionality) is a powerful democratizing force in the world.

Rather than forcing all institutions into a single mold, the so-called year of the MOOC has actually been an occasion for an accelerated pace of experimentation with what it means to be a university in the 21st century. This is the beginning of a process that will encourage diversity, not conformity. The developments of 2012 were, in effect, a graphic illustration of Linda Lorimer's insistence that the idea of a university is as diverse as the nations and regions in which universities are found. It is embodied in a recent finding of the WEF's Global Action Council on the future of universities:

The missions and structures of universities will continue to vary widely from country to country and within a country. We believe however that these different institutions are driven by the same fundamental purpose, whether they are undergraduate-driven institutions or research universities: to disseminate knowledge through their faculty members' teaching (World Economic Forum Global Action Council on the Future of Universities, 2012).

Economic Realities

What are the economic realities driving this change?

1. Universities have to balance access and affordability with value and a commitment to a social contract.
2. Stakeholders whose needs are not satisfied and whose desires are not supported will bypass incumbents, effectively establishing "bypass economies" that support their needs.

3. Technology has created a bypass economy, presenting consumers with many alternatives. This creates a clear imperative for incumbents to compete by refocusing on affordability, value and reputation.

Value refers directly to the effect that university education has on the life of an individual stakeholder. The social contracts are as unique as are the individual institutions, but in virtually every culture, there are many, often competing stakeholders

It is tempting to invent simple “business models” for higher education in which students are customers paying for a service. In that kind of single-sided marketplace prices are determined by the marginal cost of production. Technology has the effect of driving down the cost of production, but in reality prices continue to rise. This seems like a paradox. But other university stakeholders are in effect customers, too. Like students, they also draw on a portfolio of goods and services. Research sponsors pay for intellectual property, governments pay for economic development, broadcast sports networks pay for entertainment, and taxpayers pay for cultural enrichment. The costs of providing these services are connected and in larger institutions are cross-subsidized. What constitutes a fair price in such a complex business is not so easy to determine. In effect, a university is a multisided business, a platform that delivers services to all its stakeholders.

However good this might be for the broad sweep of university stakeholders, students are often left out. Academic budgets are sapped to support money-losing research ventures or other activities that are not core to the education. Gains in efficiency from technology do not necessarily translate into benefits for students because, for example, money saved in classroom delivery subsidizes other platform participants. Universities can live (and in some cases, thrive) without research operations, dormitories, and performing arts center, but they cannot long survive without students.

Like other multisided businesses from newspapers to executive search firms, universities run the risk of foundering as their most critical stakeholders make the leap to growing bypass economies, enabled by MOOCs and other technology innovations. Bypass economies tend to destroy long established boundaries (Zuboff & Maxim, 2002) as services that are desired by many become increasingly unaffordable, until trust with stakeholders is fractured. At that point businesses can be replaced by external networks that had been previously invisible. That network is already in place for higher education, and many existing institutions – the incumbents – are ill equipped to recognize it.

This is the danger of incumbency. Successful incumbents become complacent. They take stakeholders for granted. Universities have had good reasons to be complacent. Universities have long been not only gateways, but also gatekeepers. In order to obtain a college education, students for the last thousand years or so have been bound to the admissions criteria, quality standards, and curricula of traditional

institutions. Technology is erasing those boundaries and opening classrooms to many millions of new students to whom access was impossible a generation (or even a decade) ago.

How does an incumbent survive in a bypass economy, when boundaries are erased and there are many competing options? This is the third economic reality. Incumbents have no favored position in a bypass economy. There will be a handful whose brands carry them through disruptive times, but most will find themselves priced out of a rapidly commoditizing marketplace. Those few who manage to find a way to affordably deliver their services, will find that competitors who claim to do it better and cheaper have undermined their once unassailable value.

Accountability for Mission

A persistent criticism of the new ecosystem is how accountability is going to emerge from the seeming chaos of a disrupted marketplace. In the current version of higher education, bureaucracies insure accountability. In Asia and most of the Americas, a system of accreditation based on industrial principles of quality assurance (DeMillo R. , 2013), protects the public interest by measuring and improving learning outcomes, separating low quality providers of educational services from legitimate colleges and universities. In Europe, quality is assured legislatively with adherence to standardized curricula and examinations. South Africa and most of the Arab world follows European standards, while central African nations are only beginning to define their approaches.

In its American incarnation accreditation exists because of a confluence of two otherwise unrelated historical trends. The first involved the massive outpouring of philanthropy to institutions of higher learning at the beginning of the 20th century. Shocked by the dismal state of university administration and accountability, industrialists like John D. Rockefeller and Andrew Carnegie demanded minimal standards as a condition for receiving grants and gifts. These were men of industry who were enamored with industrial management practices, including quality control and measurement. The second trend was spurred by the massive increase in enrollments on the mid-20th century, increases that threatened to overwhelm the nation's colleges. The solution was to make institutions more efficient. Efficiency in post-WWII American meant factory efficiency, and so colleges and universities adopted the methods of the factory floor.

The mission statement of nearly every accrediting body begins with a recapitulation of the need for quality control in higher education. It is the factory model that is crumbling, and it is being replaced by a new ecosystem for higher education. That does not bode well for traditional accreditation.

It is now economically feasible for a student anywhere in the world to piece together, jig-saw like, a curriculum that matches his or her needs and to have both the curriculum and the student's performance certified in a way that is accepted by academic institutions and employers alike.

This is not a factory. The focus on higher education has irrevocably shifted from institutions to students. The factory model with its manufacturing vocabulary will be irrelevant, and so will the language of quality control that has dominated higher education policy for the last hundred years. What will replace it?

Competency-based assessment, once regarded as a poor cousin of real assessment, will almost certainly play an important role in the new ecosystem. MOOC providers like Coursera and Udacity have recently embarked on monetization strategies modeled on the successful LinkedIn™ model of referrals. In this model, non-institutional providers offer proof that a student has accomplished a goal, learned a skill or demonstrated an ability that an employer seeks. The American Council of Educators (ACE) has already signaled its willingness to equate such demonstrations to standard university credit (Chronicle of Higher Education, 2012).

Accreditation is a standards-based industry in a marketplace where standardization is being marginalized. It is a difficult position for standards-setters and evaluators to be in and heaping more institutional requirements on an already strained system is not the answer. There is a promising-sounding but mainly unused section of Federal Title 34 Regulations called Direct Assessment that allows for the substitution of "direct assessment of student learning or the recognition of direct assessment of student learning by others." (US Congress) In March 2013, The US Department of Education issued a memorandum that clears the way for application of Direct Assessments by allowing Title IV funding to be given for demonstrated competencies. This permits institutions that wish to use MOOCs or other competency based assessments as a basis for credit to do so.

The world will still need a way to judge who has learned what (in the same way that Amazon.com and eBay customers need to know the quality of products and merchants). So how might that be implemented? The outlines of an answer are just beginning to take shape. In fact, some of the answers have already been tried. Take High School Advanced Placement (AP) exams for example. Universities of all stripes routinely grant college credit for successful completion of AP courses upon presentation of satisfactory exams scores – a model not unlike the one recently proposed by the American Council of Educators (ACE) for "accrediting" MOOCs (Chronicle of Higher Education, 2012).

Most importantly, the new ecosystem allows higher education to establish a global market for quality. In the new ecosystem value is king, and any approach to accreditation that does not draw a straight line from assessment to value on a certificate or diploma is doomed.

Value and the New Ecosystem

Around the crumbling boundaries of incumbent universities is an odd combination of traditional institutions that seem bent on redefining their value and institutions that see change around them but are convinced that they will be unaffected. They are trying to find their way in a marketplace that is growing accustomed to the rapid pace of change.

What pumps energy into this new ecosystem is the optimistic view that old limitations can be overcome. The “can’t do’s” have changed mainly because technology has taken down barriers. Let me mention three of them:

Cost: College costs are controlled by high labor costs, the high cost of physical plants, and high materials costs. All three of these factors have held university budgets hostage for decades, but technology enables new approaches. For example, open courseware and online delivery allow both deskilling and the use of lower-cost more flexible physical plants, both of which lower costs.

Learning: It has been known since Benjamin Bloom’s landmark study (Bloom, 1984) that the best classroom outcomes are achieved by non-normative mastery methods in which student progress is tailored to the individual, an approach that is prohibitively expensive without technology. With computer-assisted mastery classrooms, student performance can be reliably improved by two standard deviations at negligible marginal cost.

Individualization: The trajectory of American higher education has been toward increased specialization and individualized instruction. New program costs increases nonlinearly without technological support but new internet-based personalization technologies enable tailored curricula, content-based advising and individualized analytics that would otherwise be impossible. The idea that students can “hack degrees” to suit their goals and expectations is now gaining support as tens of thousands of students are beginning to combine courses from dozens of top-rated universities.

In this new ecosystem value dominates. It is open by design and construction and so incumbents risk playing a diminished role as attention shifts from institutions and programs (where accreditation and assessment have traditionally focused their attention) to individual students. Economically, it is the scale of the Internet that dominates. Hundreds of millions of new students, combining courses offered by many institutions in unexpected ways requires not authorities, bureaucracies and processes, but *platforms* that are flexible, adept at scaling to the demands of the new

bypass economy. The question for all legacy organizations in the new ecosystem is, "What value do I add?"

Works Cited

Bloom, B. (1984). The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring. *Educational Researcher*, 6 (13), 4-16.

Bowen, W. G. (2012). *The "Cost Disease" in Higher Education: Is Technology the Answer?* Stanford University Tanner Lectures. ITHAKA.
Chronicle of Higher Education. (2012). *MOOCs Take a Major Step*. Retrieved from <http://chronicle.com/article/MOOCs-Take-a-Major-Step/135750/>

DeMillo, R. A. (2011). *Abelard to Apple: The Fate of American Colleges and Universities*. MIT Press.

DeMillo, R. (2013). New Ecosystems for Higher Education and What They Mean for Accreditation and Assessment. *WASC Concept Papers, Second Series: The Changing Ecology of Higher Education*. WASC.

Pew Social and Demographic Trends. (2012). *The Digital Revolution and Higher Education*. Pew Research.

US Congress. (n.d.). Education Subtitle B Regulations of the Offices of the Department of Education, §668.10 . *Code of Federal Regulations, Title 34* .

World Economic Forum Global Action Council on the Future of Universities. (2012, December). Internal Memorandum from December 2012 Meeting. Tokyo, Japan.

Zuboff, S., & Maxim, J. (2002). *The Support Economy: Why Corporations are Failing Individuals and the Next Episode of Capitalism*. Penguin Books.