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# The New Era of Information Abundance: What Does It Mean for Higher Education?

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JULY/AUGUST 2015

### TAKEAWAYS

Higher education is entering an era of information abundance driven by increasingly mobile and iniquitous information technology and “big data.”

Colleges have no control over information technology and the abundant information it makes possible, but it is generating the need for reform and innovation in how institutions organize and



support learning.

There is now unprecedented potential to personalize higher education's services while making them more career-appropriate and affordable. Boards must think urgently and hard about the need for adaptive changes in their institutions.

It has become a truism that higher education is facing a wide array of disruptive forces that are bringing changes to the business and operational models of institutions, as well as to the ways that instruction and other services are delivered to students. But what is the root cause of all the disruption in higher education today? I believe it is contemporary society's transition from an era of information scarcity to one of information abundance—stemming primarily from the

outputs of, and interconnectivity enabled by, information technology.

Let me open, however, with one caveat. Although the disruptive forces that we all face have consistent themes, characteristics, and consequences, no uniform or consistent “fix” will assist all institutions. Each board and institution— with its distinct history, culture, and brand—will have to wrestle individually with how to respond to the disruptive environment surrounding them, coming up with institutionspecific solutions. For most colleges and universities, however, significant change and adaptation are in the future.

I say this based on a career that has included service in the public and private nonprofit sectors as well as my current position in the proprietary sector at Kaplan University. In addition, I have served on several nonprofit boards, including my service today on the board of the Vermont College of Fine Arts. My comments in this article are relevant to colleges in all sectors.

## THE SITUATION TODAY

Historically, colleges were a by-product of information scarcity, organized to collect otherwise limited resources—books, faculty, laboratories—in one place so that selected people could come and benefit from them. And each college, operating as an island of opportunity in an informationpoor society, controlled all the programs of study, patterns of faculty governance, and modes of teaching.

Today, however, we are entering an era of information abundance driven by increasingly mobile and ubiquitous information technology and its partner in disruption, “big data”—large digital databases that allow information to be aggregated, tracked, and manipulated in ways that were impossible in the past. The sources of this abundance lie outside of the academy and, therefore, beyond its control.

For example, vast digital databases offer analytical opportunities that were simply unthinkable in the

recent past, transforming, among other things, our understanding and use of textbooks and career planning. And student progress, historically a linear path marked by courses and semesters, can now be affected by adaptive curricula that measure and continuously report on a student's advancement—aggregating and storing information that was heretofore unavailable. Meanwhile, MOOCs (massive open online courses) have made world-class curricular content available for free to anyone with access to the web, forever changing access to quality curricula.

More abundant information affects traditional policy areas in higher education, such as:

- **The role of the faculty.** If instructional designers create an online curriculum that assures quality and consistency of content across all sections of a typical course, including the learning outcomes, major prerogatives of the faculty have been assumed by others. Additionally, control of the classroom is another prerogative that has been infringed upon by the use of common learning outcomes and consistent content.
- **The academic need for the traditional campus.** Campuses are not going to go away. But if content can be accessed online and information sources can be Googled, how campuses are used will have to change. Increasingly, the concept of a four- or five-year haven away from the real world, with students immersed in social, academic, and athletic activities created and offered by the campus community, will be seen as ineffective, inefficient, and too costly for many students, given other learning avenues that become available.
- **The assumption that the traditional college model is the most effective path to success for all Americans.** This is already breaking down. Recent college graduates, and some non-college graduates, attend “code academies” to learn computer coding so that they can move directly into well-paying coding jobs. There are predictions that “just in time” learning will continue to increase, as will the unbundling of academic programs so that students can take what courses they want and need, when they need to. In these scenarios, attaining the degree is no longer the price of enrollment or the definition of success.

In the emerging era of big data, government officials, donors, and the general public will also know a lot more about an institution's effectiveness than in the past. Historically a college's reputation was based on the quality of students that it admitted, its educational mission, and/or a local or regional reputation based on its years of service. The era we are now entering, however, will see hard data on collegiate and other websites depicting time-to-degree rates; graduation rates; employment rates of graduates; and myriad other pieces of information that portray the ramifications of attending the college; the odds of a student's success academically; and the return on investment after graduation.

The more people know about an institution's effectiveness, or lack thereof, in preparing students for social, civic, and economic citizenship compared to the price and cost of the college and students' future earnings, the more they may question a program's viability compared to possibly cheaper or shorter alternative routes. And the more people see the opportunity to link high-quality, low-cost curriculum content to measureable learning outcomes leading to career and work readiness, the more they probably will question the efficacy and value of traditional academic models. We live in a world where such

comparisons among institutions, comparisons that were never before available, will become commonplace, drastically changing the higher education marketplace.

At the same time, traditional campus operational structures are more vulnerable than ever before. In the era of scarce information, academic and governance practices could largely mediate and, indeed, block pressures for change from the outside. Today, however, those same practices protect increasingly expensive cost structures while hindering the institution's ability to respond quickly and flexibly to changes in the marketplace or to adopt new technologies that improve educational attainment while lowering costs.

For people who would try to ignore the disruptive forces, a strategy that has worked in resisting innovation and change in the past, this time it is different. Many of the forces driving disruption and innovation lie beyond the campus boundaries. As a result, traditional institutional practices cannot control them. They are also generating the need for reform and innovation in how institutions organize and support learning. Learning today can happen at any time and in pretty much any place. Institutions will have to understand the implications of a content-rich world and translate those implications to their local reality as they adjust and adapt.

## **CONSEQUENCES OF INFORMATION ABUNDANCE**

Board members and other senior leaders must understand two critically important things about information abundance. First, it stands the traditional role of the college on its head. And second, our colleges have, for the first time, no control over the driver of this disruptive change: information technology and the abundant information it makes possible.

Beginning hundreds of years ago, colleges and their campuses were formed in response to an information-scarce environment. Not enough informed scholars? Gather the few that there are together in a community of scholars called the faculty. Not enough books? Organize a library. Need special space for experiments? Build labs. And so, in an information-scarce society, the development of campuses was the only way to pursue organized higher education.

This scarcity of information caused another type of scarcity—limited capacity on the campuses that existed. Today, we call this the “access” problem. So decisions had to be made about who would be admitted and who would be turned away. Even as the opportunity afforded by campuses was expanding, limits to accessing that opportunity were growing as well.

As the value of higher education became apparent to our government leaders, enormous investments in campuses and the special resources they represented were made, beginning with the Morrill Act of 1862 and continuing through the community college boom in the last half of the 20th century. Access, as a physical matter, was going to be provided by putting lots of campuses close to the learners that they would serve at a very low cost to the student. The perceived value was so great that communities and states were willing to pick up the tab for much of the cost through direct appropriations as well as indirect appropriations such as property-tax forgiveness.

On a parallel course, beginning with the GI Bill, investments were made in financial aid to support the

college aspirations of historically underserved or unserved populations. Even with the structural inequities that we know exist, it is fair to say that institutional, state, and federal financial aid have been responsible for diversifying the access that financially dependent students have had across the many types of institutions that make up the rich mosaic of American higher education.

Both of these expansions were based on the assumption that, in an information-scarce society, access to campuses was the key to opportunity for the middle and working classes. Now, however, we are beset by a tidal wave of new types of services made possible by information technology and the abundant information it generates. This can change the expectations and the aspirations of many people, young and old, for higher education. And, as is evidenced by new educational ventures that are popping up, the traditional academy no longer controls the keys to content and instruction, the transfer of credit, or the assessment of learning. Examples of such services in these areas include:

- StraighterLine, an online education company that offers the most in-demand, lower-division courses in the country. StraighterLine's courses have been approved by the American Council on Education, with recommended numbers of credits for each course. And scores of colleges participating in a consortium now accept such credits. The net effect is that a high-quality, lower-division program is available at a fraction of the previous cost.
- Pathbrite, an educational portfolio business that allows learners of all types and stripes to collect and store records of their learning for use in career, future academic, or personal decisions.
- CLA+ (Collegiate Learning Assessment plus), an assessment business that measures learners' cross-cutting intellectual abilities, such as critical thinking, problem-solving, writing, and numeration skills. Based on the Common Core high-school standards, the CLA+ allows students to assess their own progress from year to year.

Dozens of educational services such as these are launching every year, changing the higher education landscape for the average learner.

## **HIGH-QUALITY, FREE ONLINE CONTENT AND COMPETENCY-BASED ASSESSMENTS**

Much has been written about MOOCs and competency-based education recently. MOOCs and the institutions that spawned them have added significant legitimacy to online learning and technology-mediated learning in general. Before, despite evidence to the contrary, online learning was considered a fringe activity that was inferior to campus-based learning. But when the Massachusetts Institute of Technology, Stanford University, and Harvard University got involved, it was a game changer.

In addition, MOOCs represent the advent of a time in which high-quality content, offered by the best professors in the world, is available to anyone who wants to use it, for free. And the implications for many colleges that charge thousands of dollars each year to offer their own curricula may be dire. If the quality of a college's own content is not a distinguishing factor, what are the distinguishing factors that make it a good social, economic, and personal investment?

While some point out that the use of MOOCs results in very low student completion and passage rates, I

think that misses the larger point. As free, high-quality resources, MOOCs can form the basis for a college curriculum offered by a different or new institution in which academic support and assessment are provided. Already, several colleges have developed processes to award academic credit, based on their own assessments, for MOOCs.

For its part, competency-based education (CBE) strikes at the status quo from a different, yet equally disruptive, angle. The fundamental concept behind CBE is that there will be clear evidence of what the learner knows and is able to do, and how well, when he or she graduates. The opaqueness and inconsistency of course evaluations that faculty now conduct can be replaced with more-consistent and reliable assessments. As data analytics grow in the practice of higher education, flexibility in the learning environment, the positioning and use of content, and the reliability and quality of assessments will grow. Those developments will not replace the need for faculty members, but their roles and responsibilities will change to respond to newly available data.

Our understanding of access also will change because online learning will allow institutions to enroll not just the best students in a pool of applicants, but rather a wider range of applicants. When physical “space” is no longer a cause for limiting access, the rules of the game change dramatically.

## **THE NEED FOR INCREASED EFFECTIVENESS**

We are hearing a growing chorus of criticism from employers that, while students may be “ready to graduate,” in too many cases they are not yet “ready to work.” As the president of a highly regarded private institution told me recently, “We are branded by our institutional name and history. When it comes to getting graduates jobs, our alumni network and reputation are a big part of our success. But most colleges are known in the marketplace for the success with which their graduates attain and hold jobs. Their reputation is situational, not assumed.” This is a candid assessment of the situation that non-elite colleges, and their graduates, face.

And yet, many of these same colleges are the ones working with people from marginalized backgrounds and populations, preparing them for the jobs of America’s future. In all but a very few cases, the practice of using advisory boards composed of business people and content experts to connect curricula to jobs will not be sufficient to generate the confidence in graduates that employers currently lack. New approaches like CareerJourney allow learners to investigate careers and assess their own affinity and readiness for specific ones. CareerJourney can give learners better information about job requirements and the “match” between their skills and workplace requirements than some college counseling offices.

Strengthening assessments to include evidence about cross-cutting intellectual skills (problem-solving, critical thinking, writing) and behavioral traits (leadership, teamwork, and diversity) will supplement traditional academic information. And, increasingly, big-data analytics are likely to be used to interpret academic achievement in terms that the workplace understands, eventually developing and using “skill transcripts.” The days of saying that a graduate is ready for work because “we say so” are coming to an end.

Another new model that is a challenge for the traditional college is the rise of “academies” and other

alternative credentialing efforts that lie outside the campus's boundaries and influence. Those that develop a strong track record will provide people with a ticket and route to work that doesn't currently exist. And, as the ticket to work becomes available through other means, colleges will be faced with several choices, including:

- 1) evaluating and accepting such external sources of training for academic credit and integrating them into their curricula;
- 2) finding a way to compete with them head-to-head; or
- 3) refashioning their programs in other ways to meet the needs of their learners.

## **THE REAL DIFFERENCE: A PERSONALIZED LEARNING PATH FOR EACH STUDENT**

The fundamental shift that underlies all of these changes is from educating all students the same way at the same pace in a lecture hall or laboratory to individualizing and personalizing each student's education. Higher education is starting to adopt "adaptive learning," a technology-based educational method previously used in K-12 schools. Adaptive learning allows for personalized learning, adjusting instruction to improve student outcomes.

To accomplish this, computers use digital learning platforms, like ones developed by Knewton, an adaptive learning company that has developed a personalized content platform, to perform real-time analysis of student performance. The technology varies from simple, rule-based models to more complex, algorithm-based ones that predict the probability of student success in a particular module of a course. Some newer, more advanced systems, which use skin sensors or special chairs that measure posture and body language, can assess a person's emotional state so as to help motivate a bored student, for example.

Despite the improvements in retention rates and student success, the high initial cost of the technology has prevented adoption of the model on a wider scale. However, the Bill & Melinda Gates Foundation announced a \$1 million grant package in 2013 designed to develop adaptive courses at 10 colleges and universities, which in turn is encouraging other postsecondary institutions to incorporate the approach. Institutions experimenting with it include Arizona State University, Southern New Hampshire University, Western Governors University, and my institution, Kaplan University.

As journalist John K. Waters noted in "The Great Adaptive Learning Experiment" in *Campus Technology*, "Technology isn't strictly required for personalization; a professor personalizes a student's experience, for example, when she takes him aside and recommends extra reading. Adding the tech makes it possible to personalize at scale." Adaptive learning makes use of analytics to track each student's progress. In an EDUCAUSE report, "Building Organizational Capacity for Analytics," authors Donald M. Norris and Linda L. Baer observe: "Optimizing student success is the 'killer app' for analytics in higher education. Intelligent investments in optimizing student success garner wide support and have a strong, justifiable return on investment."

An adaptive learning system can be facilitator-driven, when instructors are provided with student and

group profiles and make any teaching adjustments themselves, or assessment-driven, when content provided to the student is modified in realtime based on student performance.

Proponents of adaptive learning contend that it allows faculty members to concentrate more on covering new material, as opposed to spending time in review, and to focus one-on-one on student engagement and self-pacing throughout a curriculum. They believe that adaptive learning ultimately can reduce course drop-out rates, promote student success, and eventually cut costs for students and institutions.

## **CONCLUSION**

The economic problems facing many institutions are not anomalies, nor are they necessarily anyone's "fault." They are the results of changing times, academic tools, and technology. These changes are simultaneously transforming the expectations that learners, administrators, employers, faculty members, and legislators have for higher education. At the same time, we in higher education have unprecedented potential to personalize our services while making them more career-appropriate and affordable. The external factors make it essential that boards think urgently and hard about the need for adaptive changes in their institutions. For most of us, standing still is not an option.

## **MARKETING AN ADAPTIVE WAY OF LEARNING**

Armed with a \$100,000 grant from the Bill & Melinda Gates Foundation, Saint Leo University near Tampa, Florida, has been conducting an adaptive learning experiment in its online Marketing 301 class. The results are in, and the course looks like a winner, both for the students and the teachers.

Since 2013, 14 college and university grantees have been testing out different platforms to support online classes that were developed by the institutions themselves, reporting back to Gates about the efficacy of the underlying technology. Saint Leo chose an undergrad marketing class, creating a fictitious senior care company, complete with staff and clients, for students to market. Students were given scenarios to which they had to respond. If they did so correctly, they moved on; if not, they looped back, at which point the program adapted to their skill level until the student successfully completed the task. A control group simply took multiple-choice tests.

The students using the adaptive technology "were more engaged and enjoyed it more," said John R. Lax, an instructor of marketing who helped design the course. He and his colleagues collected and studied data from nine semesters (online semesters are eight-weeks long); students from around the country and the world, including on many American military bases, participated in the class.

Their conclusion? "This is a valuable way of delivering online education. It's much more effective [than traditional online learning]," said Lax. "And frankly, it's a differentiator. This is a competitive business. A lot of people are teaching principles of marketing online. If you have a superior product that differentiates you somehow, that gives you an advantage in the marketplace."

Although the grant period has ended, the university will continue to teach this marketing class using



the adaptive curriculum, which will be viable for several years, with small tweaks to language and scenarios. Lax would like to see the technology expanded to include all marketing classes, but that takes money, and time. The university is weighing its options. He's up for the challenge, though.

"On a personal note, it was great fun," Lax said. "It was a lot of work, but it was great fun creating the cast of characters and the scenarios." —*Julie Bourbon*

## REDESIGN AT KAPLAN UNIVERSITY

Kaplan University has developed the Open College at Kaplan University (OC@KU), a free-standing program with, among other things, different delivery, academic, and pricing structures. We started with the commitment to adapt our resources to the needs of our learners, rather than asking them to adapt to our assumptions about how or what they should learn. And along the way, we have created a personalized-learning concierge service that, for no charge, helps learners understand what they already know and think about different career paths in a collaboration with LinkedIn. Learners can also take free courses that we offer and then come to us for a low-cost assessment of what they learned in the courses.

If and when learners opt for the degree program, we will assess all of their experiential and prior learning for advanced standing, help them write an independent learning plan (ILP), and engage in a MOOC reference system that aligns specific free and open resources to meet the learning goals of their plan. In this guided independent-study program, by focusing on planning, assessment, and mentoring while using existing free and open content, we are able to keep the program very affordable while paying close attention to students' learning and assessment.

The college and Kaplan are creating other strategic partnerships with key organizations to advance this student-centered approach. For example, we have created LearningAdvisor in conjunction with AARP's "Life Re-imagined" program. Learning- Advisor, as its name implies, helps each student sort through aspirations and needs for additional learning and then find the resources to meet his or her needs. —*P.S.*

## ABOUT THE AUTHOR ►

Peter P. Smith is founding president of the Open College at Kaplan University. Previously, he was senior vice president of academic strategies and development for Kaplan Higher Education. He is the former assistant director general of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and served as founding president of California State University at Monterey Bay.

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