Data, Analytics and Student Learning

September 2015

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Platform Analytics and Educational Research Director

1 "2012 ECAR Study of Analytics in Higher Education." EDUCAUSE.
Web. <http://www.educause.edu/library/resources/2012-ecar-study-analytics-higher-education>.

Introduction

Throughout American higher education, faculty members and administrators strive for improvements: to help more students complete courses and degrees, to improve teaching and learning, to provide a high quality education in the most affordable way, and so forth. The goals vary from institution to institution, of course, but the push is everywhere. But how should colleges identify their weaknesses? How should colleges develop and evaluate their plans for improvement? How should colleges report to stakeholders on their progress?

Increasingly in recent years, colleges have embraced the idea that data and analytics -- not just gut instincts -- must be central to answering such questions. The articles in this booklet explore some of the issues related to data and analytics, and their use by colleges.

Inside Higher Ed will continue to cover these topics and welcomes your reactions to this compilation of articles, and your suggestions for future coverage.

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The Language of Learning Analytics

Caliper, an initiative to standardize collection and reporting of learning analytics, is nearing release. Can colleges and vendors learn to speak the same language?

By Carl Straumsheim

The world of learning analytics is full of metaphors. Educational-technology companies are "islands," disconnected from one another. Data are locked away in "silos." As an initiative to standardize the collection and reporting of learning analytics nears a public launch, can colleges and vendors learn to speak the same language?

"Analytics" is one of the hottest buzzwords in education. For ed-tech companies, it is also a selling point. By using vendors' suites and solutions, colleges will gain access to data about why some students succeed and where and when others stumble -- or so the pitch goes.

But there's a catch, said Linda Feng, senior product manager for analytics and SIS integration at Instructure. "The whole premise is that all that data has to be in their world," she said.

Step outside that world and try to take the data to another platform, and it quickly becomes a conversation where both sides are speaking in different languages.

Colleges are rarely tied to a single vendor. They may be tracking course enrollment patterns with one system, retention with another and tools to measure engagement with yet another -- and those systems all produce data. Extracting data from those tools and platforms is one issue; making the data say something meaningful about what students are doing is another.

"All these systems have their own languages that are written for their own needs," said John Whitmer, director for platform analytics and research at Blackboard. "In order to talk a common language, we have to agree to a common vocabulary.... If you don't have a common vocabulary, you can't write the world's most beautiful poem."

Blackboard, Instructure and the more than 320 other vendors and universities that make up the IMS Global Learning Consortium have for years been working to agree on which words go into that vocabulary, and their work is finally nearing its version 1.0 release. Known as Caliper, the vocabulary -- called metric profiles -- and the mechanisms to detect the words in it -- sensors -- will serve as a framework for tracking and reporting learning analytics.

Should Caliper be supported by a large number of colleges and vendors, it could become the standard for how student learning data are collected. But Caliper is still only available as a release candidate to members of the consortium and is still "a couple of months" away from public availability, said Rob Abel, CEO of IMS. The larger market of colleges and vendors, which will help determine if Caliper becomes a widely adopted standard, has yet to take a look at the framework.

Until the public release, IMS and its members are therefore managing expectations.

"Whenever standards are sold as the magic that solves all problems, that's a concern to me," Abel said,

before resorting to another metaphor. "They're not. They're just plumbing."

'What Data Can I Get?'

It is difficult to speak concretely about how Caliper will be used when that decision ultimately rests with colleges and vendors -- which is perhaps why people resort to metaphors to explain what the framework is. On its own, Caliper is not a dashboard or an app that automatically explains how students learn. Those tools must be built on top of the framework.

"[Caliper is] certainly not going to figure out what the best analytics approach is, but it's going to make it easier for institutions to get data from applications so they can actually understand what it is and process it," Abel said. "We think that's about right for the market where it is now."

That approach is similar to how the consortium developed the Learning Tools Interoperability framework. LTI didn't create Khan Academy, ProctorU and Wikipedia, but it created a standardized way for those organizations to make their tools embeddable in learning management systems and other platforms.

Caliper builds on the interoperability framework, Abel said. Now that apps and platforms can easily connect to one another, he said, "Then the next natural question

you ask is, 'Well, what data can I get?'"

While only a handful of colleges and vendors are ready to ask themselves that question, Abel said, some Caliper work group members have begun to identify potential use cases. One common idea is the potential they see in capturing and reacting to real-time data.

The University of Kentucky is perhaps farthest along with its plans. Vince Kellen, a senior vice provost and chief information officer there, said the university plans to extend its early warning system using data collected from when students engage with course content. Kellen co-chairs a Caliper work group tasked to look specifically at how learning analytics could power real-time messaging systems.

"If a student disengages in the middle of a term, we sometimes don't know if it's because of finances, if classes are too difficult or if they're not sure if they belong here from a social standpoint," Kellen said. "By getting that interaction data, we can do a better job of detecting that sooner. If we can interact with the student sooner, we can help them better."

Another co-chair, the University of Texas at Austin's Phillip D. Long, expressed interest in a similar system. "The thing we have done the least well at most large universities is in providing feedback," said Long, an associate vice provost at UT-Austin.

Such a system would first have to learn the pathways students take through content on their way to a passing grade before it would know when to flag when students are headed in the wrong direction, Long said. Once it has learned those patterns, he said, the system could, for example, notify an adviser when a student fails to review before an important quiz.

"When students are actually engaged in activities and assignments is when the opportunity is most present for being able to influence their thinking," Long said. "We've never been in a position where the technology has had this degree of temporal responsiveness."

The universities are also motivated to participate in IMS on Caliper out of a concern that sitting out would mean vendors get to decide who controls the data collected by tools and platforms, Kellen said.

"There's a danger that the vendor community can say, 'This is our data, not yours, and you have to pay us to learn how you teach students,' " Kellen said. "I disagree with that. The academy needs to have the line of sight to the student in digital form."

Becoming a Movement

Dan Rinzel, senior product manager for analytics at Blackboard, said that wariness of vendors is one of the reasons why the company is a member of the consortium.

"It is important for us to participate and be early adopters in the specification for the purpose of participating well in the ecosystem and being good data stewards," Rinzel said. "There's some undercurrent of unease that some institutions have about where the data resides, who has access to it, and we definitely see ourselves … making sure that there's no sense that data is being locked away."

Blackboard in July 2015 became the first company to have one of its products complete the Caliper certification process. The company doesn't have any im-

mediate plans to build anything on top of the framework, but decided to support Caliper "in the interest of supporting standards and standards-based work," Whitmer, the Blackboard director, said.

D2L has yet to run its learning management system, Brightspace, through the process, but it helped lead the Caliper work group. The company has already announced plans to support Caliper.

In some cases, vendors' plans for Caliper are not very different from those of colleges and universities. Instructure, which develops the learning management system Canvas, is also exploring the uses of real-time data.

In a proof of concept demonstrated earlier this year, the company showed a dashboard updating in real time as a fake student navigated to a quiz, submitted it and received a grade. The company is working on a "live event stream" that builds on that proof of concept, Feng, the Instructure senior product manager, said.

Instructure plans an official uptake of Caliper later in 2015, Feng said, and the company intends to build an "ecosystem" of partners that will develop tools that build using the data reported out from Canvas.

"Similar to how LTI tools became a movement, Caliper also needs to become a movement," Feng said. "No one vendor by themselves is going to be motivated to do Caliper on their own."

Early interest from Blackboard, D2L and Instructure is "almost a sure sign that [Caliper is] going to succeed," Abel predicted. Normally, vendors are "reticent" to support new standards, he said. Before the public release, more vendors need to test their products, and more how-to documentation needs to be written, he said.

"We're the first to say we think analytics in higher education is a 20-year project, and we're in year one or two," Abel said. ∎

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Phase Two of Completion

Sinclair Community College boosted student completion rates by 75 percent, but to sharpen its focus, the college began cutting some of its more than 100 completion-related projects.

By Paul Fain

Few colleges have signed onto the national college completion agenda with as much vigor as Sinclair Community College. And while national graduation rates have seen only a slow inching up, Sinclair has managed a big jump.

The two-year college, in Dayton, Ohio, first began working to improve student success in a systematic way back in 2000. That was when Sinclair was picked by the League for Innovation in the Community College as one of its Vanguard Learning Colleges -- a recognition of institutions that made "learner-centric" completion a central goal.

Since then Sinclair has tried over 100 completion-related projects, ranging from participation in Completion by Design to making new student orientation mandatory and conducting interventions in local high schools.

"Every department on campus is focused on increasing student completion," said Kathleen Cleary, Sinclair's associate provost for student success, a position the college created in 2011.

However, the college has begun pruning its student success portfolio, to sharpen its focus and concentrate on what works. One recent trim has been its participation in Achieving the Dream, a national nonprofit with more than 200 community college members.

The college's various completion initiatives fit into seven categories, Cleary said. They include teaching and learning, student engagement, K-12 partnerships, student orientation and advising, career exploration and workforce connections, streamlining the pathway to a degree and student support services. Last June Sinclair released a completion plan that describes the various pieces and overarching strategy.

"They're doing everything," said Mark Milliron, a former official with the Bill & Melinda Gates Foundation and president of WGU Texas. Milliron is a co-founder and chief learning officer at Civitas Learning, a student-success oriented company that offers predictive analytics to colleges, which Sinclair uses.
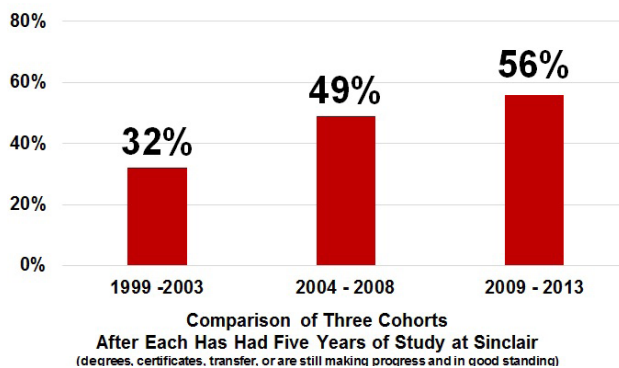
The time, effort and money -- much of it coming from foundations like Gates -- is paying off.

Sinclair, an urban college that enrolls about 24,000 students, created its own metric to track completion rates. It looked at three groups of students during five-year periods after they first enrolled.

Less than a third of students who enrolled in 1999 earned degrees or certificates, transferred or were still enrolled in good standing and making progress toward a credential by 2003. However, that number rose to 56 percent for the group of students Sinclair tracked between 2009 and 2013, a 75 percent increase (see accompanying chart).

Sinclair Student Success Rates are Climbing
75% Increase (24 pts.) over the Past 10 Years

Comparison of Three Cohorts
After Each Has Had Five Years of Study at Sinclair
(degrees, certificates, transfer, or are still making progress and in good standing)

Sinclair has had stable, committed leadership for a long time. Steven L. Johnson arrived at Sinclair as chief operating officer 15 years ago. He became president three years later, in 2002. That continuity is a big plus for making graduation rate improvements, said several experts on student completion.

The college also has had outside funding for some of its student success work.

"They were supported by foundations to come into Achieving the Dream," said Carol Lincoln, a senior vice president for the nonprofit completion group. "They've got a resource base that's quite different than other institutions."

Even so, Sinclair has made unusual progress.

Nationwide, the percentage of adults who hold college credentials only increased 2.1 percentage points between 2008 and 2013, to 40 percent, according to the Lumina Foundation. And the National Student Clearinghouse Research Center said only 39 percent of community college students who first enrolled in 2008 earned a college credential by 2014.

Amicable Split

After 15 years, Sinclair has reached a rare form of maturity in its approach to student success. As evidence of this shift, the college has begun contemplating how to pare back, by eliminating some completion-related programs so it can focus on others.

"We haven't always been good at stopping," Cleary said.

That's hardly unique in higher education, which is an additive industry. Ask a college president which programs he or she has cut in recent years and you're likely to hear a dodge or a long-winded version of "none."

As a result, some faculty members complain of "initiative fatigue," which can also be a big drain on institutional research departments.

"You have to have focus," said Josh Wyner, vice president and executive director of the College Excellence Program at the Aspen Institute. "You need a real commitment to analysis of what works."

A notable example of Sinclair making hard choices to cut back is its recent decision to suspend its formal relationship with Achieving the Dream.

The split was amicable. But it was still disappointing to Achieving the Dream, said Lincoln.

Achieving the Dream's 200 community college members pay dues to participate in data-driven completion work. The group seeks to help colleges make deep, lasting changes to help more students get to the finish line.

Sinclair signed up in 2004, as one of Achieving the Dream's second group of participants. Since then Achieving the Dream has recognized Sinclair as a "leader" college for its progress.

"They felt like they had been in long enough that they had learned what to do," Lincoln said of Sinclair. "What they're doing is really impressive."

One reason for the departure, Cleary said, was that the group requires colleges to report a large amount of data on an annual basis. Sinclair currently is required to send similar data reports to the feds, the Ohio Board of Regents, and local and national foundations.

"In an environment where we have to use resources as efficiently as possible, it did not make sense for us to continue to commit financial human resources to writing reports and providing data on an annual basis for Achieving the Dream," Cleary said via email. "Our current student success work has benefited greatly

Sinclair Community College

from our early work with Achieving the Dream and we will continue to share learning with the AtD network as opportunities arise."

Both the college and Achieving the Dream said they plan to maintain ties. For example, Cleary will speak at one of the group's events in 2015.

Some community colleges have taken a break and later returned to participating in Achieving the Dream, including New Mexico's Santa Fe Community College, and Big Bend Community College, which is located in Washington.

"There's a rhythm to these things," said Lincoln, who added that colleges should regularly reassess which projects they do. "That's the way you can decide what works and what doesn't work."

Sinclair has nixed other completion initiatives, sometimes because of lackluster results.

For example, Cleary said the college dropped its experimentation with learning communities -- where students work together in group-based learning.

"Maybe we just didn't resource them the right way," she said. "It wasn't working. We pulled the plug."

That sort of sober honesty appears to have helped with faculty buy-in to the college's completion push.

Mike Oaster is an assistant professor who teaches emergency medical services and leads Sinclair's Faculty Senate. He says the college has avoided initiative fatigue and been able to make serious changes in part because faculty members know the completion projects aren't about chasing fads.

Sinclair's approach is "not one where we thought the money was going to go away after a couple years," he said.

For example, the college has worked to reduce the number of credits students must complete in order to earn an associate degree. Now degrees require 60-65 credits, which is fewer than at many two-year colleges.

Cutting credit requirements is not an easy task, and can require the reduction of classes. That can be scary to instructors, Oaster said.

"You're sawing on a limb and you're still sitting on it," he said.

But Oaster said faculty members had confidence in

Sinclair's administrators during that process, believing the goal wasn't about eliminating faculty jobs.

"It's working," he said of the credit reduction work. "We're getting more people through at a quicker clip."

It wasn't always so. Johnson, Sinclair's president, said Vanguard and other completion efforts were controversial back in the day.

The shift happened around 2005. Unflattering graduation numbers from participation in Achieving the Dream helped create some urgency, Johnson said. And, just as important, after a few years the national projects became integrated into the college's day-to-day work.

That was the "breakthrough," said Johnson, where the "not invented here" resistance to projects faded away. "These national partners became a part of us."

Show Me the Data

Sinclair's completion push isn't just altruistic. Its leadership and faculty realize that pressure from lawmakers to improve graduation rates isn't going away.

In Ohio, as in a growing number of states, colleges now are funded in part based on a formula that factors in completion. Likewise, the Obama administration wants to tie federal funding to performance measures as part of its pending ratings system.

In some ways, Sinclair's refocusing mirrors that of the Gates Foundation. After seven years of work on completion goals, the mega-foundation announced a set of four policy priorities based on lessons learned from its grant making. Gates also is working on performance metrics it will require colleges to use as part of completion-oriented grant projects.

As state governments, foundations and feds get more aggressive about trying to hold colleges accountable, Sinclair is leaning on Civitas and other data-intensive tools to figure out what works best.

For example, the college is a participant in the Predictive Analytics Reporting (PAR) Framework. The non-profit group began as a project the Western Interstate Commission for Higher Education managed, largely with funding from Gates. It recently spun off into an

independent nonprofit.

The group provides student retention information, based on a huge amount of data points, for its more than 350 participating campuses, ranging from community colleges to research universities. For example, it helps colleges figure out what obstacles prevent students from graduating, and why. Members can compare data across institutions, too.

The goal of the work is to find causation in what is most effective in student interventions, said Russ Little, the PAR Framework's chief innovation officer, who previously worked at Sinclair. Being able to control for student characteristics is an important feature, he said.

Colleges can use it to figure out if there are "interventions that work for different groups better than others," Little said.

Sinclair has used PAR and other sources of data to try to better understand the impact of its student success work, Cleary said. For example, early numbers were promising for My Academic Plan (MAP), a stu-dent advising effort that combines prescriptive advice for students about their path through an academic program with technology-supported record keeping.

The data showed that students who received one of the plans were 3.4 times more likely to stay in college than were those who didn't. They were also twice as likely to earn a credential.

"As a result of these and other early metrics, the college redesigned its academic advising system," said Cleary. "All new students are now assigned an academic adviser who creates an individualized MAP for them and follows their progress to the completion of their credential."

The completion work is ongoing at Sinclair. After all, almost half of its students are still dropping out before they graduate or transfer. But both faculty members and administrators said they are excited about having moved the needle so far.

"It's terrific," said Cleary. "We're proud to be from Sinclair." ∎

Brick by Brick

Educause releases a blueprint for next-generation learning management systems, recommending a "Lego approach."

By Carl Straumsheim

The next-generation learning management system shouldn't be a system at all, but a "digital learning environment" where individual components -- from grade books to analytics to support for competency-based education -- fit together like Lego bricks, a new white paper recommends.

"The Next Generation Digital Learning Environment: A Report on Research," released in April 2015, advances Educause's initiative to examine how faculty members and students feel about their learning management systems and what they want from them in the future.

The effort, which is funded by the Bill & Melinda Gates Foundation, is known as the Next Generation Digital Learning Environment Initiative.

Even though virtually all colleges and universities run some form of learning management system, many faculty members have a "love-hate relationship" with the software, Malcolm Brown, director of the Educause Learning Initiative, said in an interview. On the one hand, he pointed out, it's technology "you can't live without," but on the other, it's a source of frustration and impatience for many.

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Educause hoped to consider whether existing learning management systems can support higher education at a time when many colleges and universities are experimenting with new forms of delivering courses and awarding credit. Instead of focusing on "incremental change," the researchers decided to articulate what a re-envisioning of the market would look like, Brown said.

The white paper combines Educause's own research with input from learning management system providers, accessibility and universal design experts, IT officials, university leaders, and others. Authors Brown, Joanne Dehoney and Nancy Millichap then synthesized those opinions into one overarching recommendation: that commercial providers, open-source communities and individual developers settle on a set of specifications to make different software work together -- in other words, the studs and cylinders that make Lego bricks interlock.

The specifications need to devote equal attention to five main points: interoperability, personalization, analytics, collaboration and accessibility. The first, interoperability, is described in the paper as the "linchpin" of the overall vision.

"We can't just have one big chunk of code that's going to do everything for everybody," Brown said. "Legos work because that specification is so clear and unambiguous. As long as you observe those specifications, you're going to snap together."

The specifications aim to improve both the user experience and the processes behind the scenes. As the Lego metaphor attempts to explain, interoperability means giving faculty members the

"*Lego Color Bricks*" by *Alan Chia* - Licensed under *CC BY-SA 2.0* via *Commons*.

freedom to piece together their preferred learning management systems without worrying if the tools they pick will be able to share data. That, in turn, would enable faculty members to use analytics to track student performance across a variety of software tools, the report reads.

The analytics piece is also an important element for the Gates Foundation, which has signaled its interest in improving the data collected from and reported about students.

The user-facing specifications, accessibility and personalization, focus on giving all faculty members and students the opportunity to use and customize their learning management systems. It also means giving students the ability to set personal education goals, which Educause's research suggests would make them more likely to use their learning management system.

Finally, the report recommends learning management systems abandon the "walled garden" approach -- that "a course is either public or private." Instead, the systems should let students move freely between public and private online spaces and capture collaborations no matter where on the internet they occur.

George Kroner, a software solutions professional at the University of Maryland University College, said the paper represents "advanced future thinking" about how the learning management system market can evolve.

"The biggest elephant in the room is that a lot of the systems that are used in higher ed are very course-centric in nature," Kroner said. "What we see is that probably is the biggest limiting factor of not just current-gen ed-tech products, but also the administrative systems that

support them."

In the vision proposed by the white paper, faculty members would be less tied to courses, but also to the vendor their institution chooses. In fact, faculty could connect an open-source calendar with analytics from D2L and videoconferencing from Blackboard.

While such a future may not sound immediately appealing to vendors, Kroner pointed out that learning management system providers in recent years have moved in that direction. For example, most systems now support interoperability standards, which enable developers to create software that works with all systems.

"Above all else, our vision of a next-generation learning experience is one where the needs and preferences of learners are placed directly at the center," Katie Blot, senior vice president of corporate strategy and industry relations at Blackboard, said in an email. "This means an environment that is not only personalized and collaborative, but also flexible, intuitive and driven by data to help learners -- and those who support them -- make good decisions along their educational pathways."

Colleges and universities are also exerting some pressure on vendors through procurement processes, Kroner said, a strategy that can be used to guide the market in the direction the paper recommends.

"The conversation is no longer about choosing the best LMS," said Kroner, a former Blackboard employee who served as a community expert for the paper. "It's about the best suite of technology to accomplish what your institution wants to do." ∎

Modules for Mastery

Davidson College releases blended learning modules on edX to help high school students and teachers tackle the trickiest questions on Advanced Placement tests.

By Carl Straumsheim

Davidson College in July 2015 launched a series of online test preparation modules through massive open online course provider edX to help high school students and teachers in Advanced Placement courses.

The initiative, known as Davidson Next, has been in the works since late 2013, when the college brought together the College Board, edX, regional schools and other partners to increase access to college-level course materials. Using data from the College Board, faculty members identified low-scoring question topics in calculus, macroeconomics and physics and, working with local high school teachers, built standalone modules to help students understand each concept.

"A big concern for our president [Carol Quillen] and the institution right now is trying to expand access to high-quality instructional materials, both for people coming to Davidson and also nationally," said Patrick Sellers, vice president for strategic partnerships and professor of political science at Davidson. "This effort really fits into that focus on access."

The modules are available to anyone through edX, but the initiative is particularly concerned with expanding access to underserved students. A recent study released by the National Bureau of Economic Research showed students who came to college with AP credit were more likely to graduate from college within four years, yet many low-income, minority and rural students lack access to the courses.

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"We have heard a lot about a number of initiatives that are ... trying to increase the enrollment of traditionally underrepresented groups in AP classes," said Julie Goff, project manager of Davidson Next. "What we're going to see is an increased demand for these types of resources when you have students enrolling who may not have enrolled in AP classes before."

Sellers stressed the modules are meant to supplement -- not replace -- instruction, whether that means a high school AP class or an online course. For the time being, the modules are not full courses (although those are on the way). One module, for example, breaks down the Phillips curve, an economics concept that explains the relationship between inflation and unemployment. Another explains pressure, force and flow in fluids.

In total, Davidson Next includes 14 modules in each of the three disciplines. Each module, aligned with AP curricula and approved by the College Board, was designed by a different high school teacher.

For Davidson Next to succeed, however, the college needs to get the modules into the hands of teachers. The college is working with school systems as well as tapping into the College Board's network to spread awareness about the modules, a spokeswoman said. Davidson Next will also offer an introductory MOOC for AP teachers.

"A big focus is to help teachers use these modules in a blended learning framework," Sellers said. Many of the modules include short video explanations, interactive elements and prompts to complete a task using pencil and paper. Combined with classroom instruction, Sellers said, "It's not like [students] are doing just one thing" to learn the concepts.

Teachers in North and South Carolina spent the previous academic year piloting the modules. In all, about 1,200 students and 34 teachers across 26 high schools participated. At the end of the year, 70 percent of teachers scheduled to teach the same AP courses in 2015-16 said they would use the Davidson Next materials again, Sellers said.

Davidson is working with a researcher at Harvard University to test the impact of the modules. Results from that study should be ready next summer, Sellers said.

Davidson's interest in MOOCs, combined with its status as a liberal arts college, has drawn interest from edX. Another of the college's recent initiatives includes forming a consortium with three other liberal arts colleges to work together on blended learning, which the MOOC provider pledged to support.

EdX's course lineup mostly consists of college-level content, but the MOOC provider is slowly building a catalog of high school-level courses. The edX High School Initiative, which Davidson Next is a part of, features 57 additional courses, many of them designed to help students prepare for AP tests.

Anant Agarwal, CEO of edX, said the MOOC provider launched the High School Initiative in response to the fact that most of the learners taking MOOCs have already earned a bachelor's or advanced degree. Data from the high school-level courses show half of learners lack such a credential, he said, adding that about one-quarter of learners in those courses are either parents or teachers.

"It's really moved the needle on demographics," Agarwal said.

EdX has "a number of things on our road map" to support the use of modules like those in Davidson Next in a blended setting, Agarwal said. He mentioned more feedback on student performance and new forms of student engagement as features edX is looking to add to its platform.

Davidson Next plans to apply the modular concept to other AP courses -- there are 38 in total -- but will need more funding to do so, Sellers said. A $1.8 million grant from the Laura and John Arnold Foundation, as well as some funding from Davidson, paid for the initial

modules. Other than foundational support to finance Davidson Next, the college is also exploring whether the modules could be turned into a professional development program for teachers.

"We want to be committed to this core principle of access," Sellers said. "We can't see that changing." ∎

Surveying the MOOC Landscape

An updated study of massive open online courses from Harvard U. and the Massachusetts Institute of Technology finds diverse learner populations and interests -- and the need for more research.

By Carl Straumsheim

If massive open online course offerings from Harvard University and the Massachusetts Institute of Technology could be described as a city, then computer science would be its vibrant downtown core, surrounded by less densely populated but no less characteristic neighborhoods of STEM, humanities and social sciences courses.

That city continues to grow, researchers at the two institutions are finding, but the challenges of taking MOOCs beyond the experimental stage will require more work than improving a single metric, be it the completion rate, proportion of female learners or bachelor's degree holders, they say.

Harvard and M.I.T. in April 2015 released what researchers there called "one of the largest investigations of massive open online courses (MOOCs) to date" -- an analysis of 68 MOOCs, 1.7 million learners, 10 million hours of activity and 1.1 billion logged events. The report covers MOOCs offered by the two institutions between July 24, 2012, and Sept. 21, 2014, through edX, a MOOC provider they co-founded.

The courses have faced an intense backlash in the years since *The New York Times* crowned 2012 the Year of the MOOC. What was once a promise to transform higher education has since developed largely in three directions: for faculty, MOOCs provide a laboratory to experiment with digital learning; for researchers,

a source of learner data; and for users, an outlet for continuing-education credentials.

Critics of MOOCs have attacked the courses' single-digit completion rates and the fact that most learners who enroll already hold at least a bachelor's degree. But as the Harvard and M.I.T. report shows, learner demographics and intent vary by the courses they take. Institutions that are interested in future MOOC research should be mindful of those differences, the researchers write.

"There's no grand unifying theory of MOOCs," said Justin Reich, the Richard L. Menschel HarvardX Research Fellow, who served as a member of the team behind the report. "Even though there are a lot of these courses, there's an awful lot to be gained by courses and clusters on their own terms."

The report groups the MOOCs offered by Harvard and M.I.T. into four "curricular content areas" -- one each for computer science, STEM, humanities and social science courses -- to visualize those differences (see accompanying graphic).

Computer science courses, for example, "continue to put the 'massive' in MOOCs," the report reads. Although only totaling 9 of the 68 MOOCs offered, computer science courses have enrolled 611,564 learners -- more than half of the total enrollment. That tops the 448,837 learners who enrolled in STEM courses,

of which there were 24.

STEM courses, meanwhile, enrolled both the youngest learners -- a median age of 26 -- and the most learners from outside the U.S., at 74 percent.

While 68 percent of the roughly 1.7 million total MOOC learners were men, nearly half of those enrolling in humanities courses, or 45 percent, were women. Social science courses (a category that included government and health courses) were most likely to attract learners with bachelor's degrees, at 81 percent.

"One concern that people have had is about the proportion of students who have a bachelor's degree or advanced degrees," Reich said. "In intro to computer science, that's a concern that definitely should be considered. I think very differently about those concerns in public health classes."

The study only included learners who actually accessed the course content, meaning the researchers discarded data from the 1.3 million learners who registered but never showed up.

One goal of Harvard and M.I.T.'s research, Reich said, is to give university leaders data to inform their decision making about MOOCs -- particularly when it comes to ways to measure student performance.

"We're also trying to tell people we don't want to optimize any single outcome measure independent of any other," Reich said. "Different kinds of courses are attempting to do different kinds of things and probably should be evaluated differently."

MOOC providers launched with individual courses created by high-profile academics. Since fall 2013, one increasingly popular strategy has been to bundle re-

A visualization of the MOOCs offered by Harvard U. and M.I.T.
Source: Harvard U./M.I.T.

lated courses into sequences. The dozens of MOOCs now offered by Harvard and M.I.T. have also given researchers an opportunity to see which pathways learners themselves follow. The popular computer science MOOCs, in particular, serve as hubs for other content, both in computer science and other disciplines, according to the report.

Those pathways could also help researchers determine what makes a MOOC successful, Reich said. "There may be some classes where people are way more likely to register for other classes," he said. "That may be an indication they're having a good experience. It would also be really neat to find out if people who do well in one class do well in lots of classes. We now have the data to explore that."

Despite fluctuating levels of MOOC hype, Harvard and M.I.T.'s courses have seen steady enrollment growth -- an average of 2,200 new learners a day. But the stability also means a large number of learners are choosing not to re-enroll, Reich said. That's why the report ends with a different metaphor, describing the various metrics used to evaluate MOOCs as "interacting ingredients in a recipe" to improve both online and face-to-face learning.

"If those numbers were exponential growth, then every year would be the Year of the MOOC," Reich said. "If those numbers had fallen to zero, we would be closing up shop. With linear growth, you have to start asking -- if our population learners will conceivably stabilize -- are institutions happy with that? What should we do with it? Knowing that we have a revolving population of learners doesn't answer any questions, but I think it makes the realm of possibilities a lot clearer." ∎
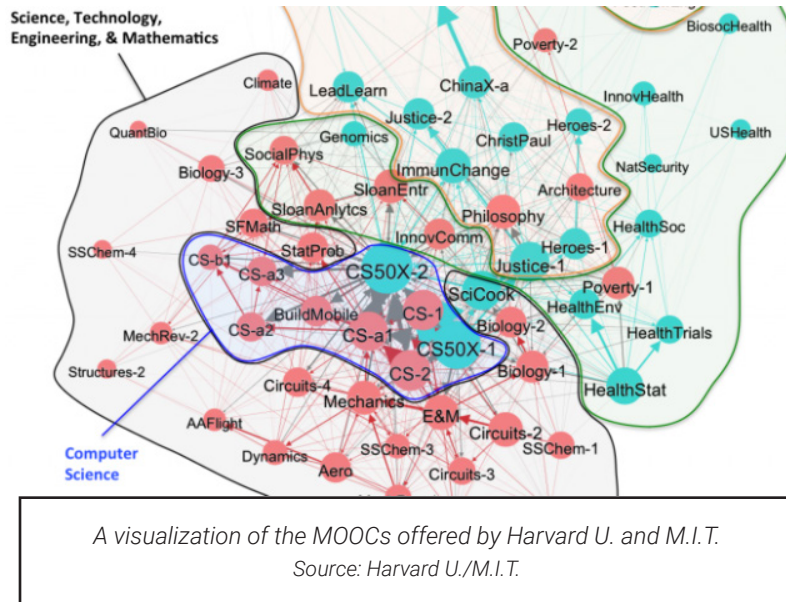
OPINION

A selection of essays, op-eds and blog posts

Going Online, Being Digital

After more than 25 years of technology-enabled education, college leaders are shifting their focus to how digital technology can improve learning of all kinds, Peter Stokes argues.

BY PETER STOKES

It's taken decades, but educational technology is finally beginning to change the way we think about education itself -- not just the way we deliver it.

Twenty-four years ago, I taught my first writing course in a classroom kitted out with 25 computers. A few years later, I team taught my first online and hybrid courses via threaded discussion boards and asynchronous email-based class discussions, respectively. Of course by that time, the pioneers in the field had already been at the online learning game for years.

In those days, online learning was about experimentation -- seeing what the new technology could do. Soon, though, online learning became a means to an end, in the form of rapid market expansion and tuition growth, aided by 100 percent year-over-year growth rates in the mid-1990s and driven by the early entrants in the market -- for-profit universities and continuing and professional education divisions at nonprofit universities.

A couple decades on now, we see millions of students pursuing degrees wholly online and millions more taking the odd online course for credit, while still millions more are signing up for non-credit-bearing MOOCs. That goes some way to underscoring the fact that online learning is an established and maturing field. But it's also flattening out. Today the growth has slowed, almost to a standstill, and thus the high-octane revenue growth phase may be behind us.

This may explain, in part, why the field is starting to be talked about in new ways, particularly as new sorts of institutions get involved, as the motivations for deploying an ever-growing number of learning technologies gradually begin to shift, as learning scientists leverage the growing quantities of data captured by these technologies and as the organizational structures online learning operates under begin to take new shape.

If the era of online learning over the past two decades was in large measure about revenue growth, the present moment is about something else.

Evidence of this change can been seen in a subtle shift in how we talk about this work. Where once we spoke consistently about "online learning," now, more and more often, I hear higher education leaders talking about "digital strategy" -- a shift in terminology that signals, I believe, a significant change in how we are thinking about the utility of learning technologies.

The phrase "online learning," for example, might be said to be associated with other terms, like growth, tuition streams, content development and professional master's degrees. By contrast, the phrase "digital strategy" is associated with a more diverse and inclusive set of terms, like pedagogy, market relevance, undergraduate and graduate programs, as well as online and residential learning experiences. If online learning was, more often than not, about money, then digital

strategy is about how we think about, define and structure learning.

As Claudia Urrea, a lecturer at MIT's recently established Office of Digital Learning, put it to me, "It's no longer just about putting content online but an opportunity to rethink learning."

Kevin Bell, who serves as executive director for online curriculum development and deployment at Northeastern University, put it somewhat more forcefully: "There needs to be a digital strategy for face-to-face courses, as well."

Interestingly, both MIT and Northeastern have been busily realigning their organizational structures in the digital realm to assist them in yielding a broader kind of payoff. The Office of Digital Learning at MIT, headed up by Dean Sanjay Sarma, is a relatively new organization into which established initiatives now report -- such as OpenCourseWare, founded more than 15 years ago, and MITx, launched in 2012 and the precursor to MIT's collaboration with Harvard, called edX.

Last fall, Northeastern brought on Chris Mallet from Western Governors University to serve in a new role as vice president of online programs, and while the job title underscores the familiar and still persistent use of "online" as a term of art, the new role was conceived as a way of integrating and expanding a diverse set of teaching and technology-related initiatives. Other institutions are similarly reorganizing, adding new layers of management and governance to oversee and harmonize their increasingly diverse digital holdings.

In 2014, James DeVaney joined the University of Michigan as its associate vice provost for digital education and innovation, with the explicit aim, he told me, of making his office's services "obsolete -- in a good way -- so that academic units are thinking about the innovative use of technology in all their learning environments." Within a few years, DeVaney added, "I would like to see the word 'digital' removed from our unit name."

One way to account for this shift in thinking is the growing awareness of the potential for educational technologies to enhance teaching and learning broadly and to strengthen the value that colleges and universities are delivering at their very core.

"I see the shift not as one from online to digital," said Eddie Maloney, the executive director of the center for new designs in learning and scholarship at Georgetown University, "but as a shift from a content-driven or faculty-driven curriculum to an intentional design and assessed curriculum. It's really about a growing focus

on learning design."

Indeed, where the online era was characterized by efforts to make technology-enabled courses just as good a classroom courses, digital strategy and learning design are about making education better -- regardless of the medium.

Of course, this isn't to say that there aren't still institutions out there looking to grow revenue by delivering programs online. And even institutions like Harvard are seeking to generate income from initiatives like HBX, an initiative at Harvard Business School, with its online courses in business fundamentals targeting alumni, corporate and other audiences. Likewise, of course, there are certainly countervailing examples to the structural integration underway at places like MIT, Northeastern and Michigan. Southern New Hampshire University and Champlain College, to name just two examples, have intentionally set out to create organizational separation between their on-campus and online learning activities, and with strong enrollment growth to show for their efforts.

For others, though, the ambitions are different. According to Josh Kim, director of digital learning initiatives at Dartmouth College, and author of *Inside Higher Ed*'s "Technology and Learning" blog, "Places that really want to protect their brand -- like Brown, Yale, Georgetown, Dartmouth -- are experimenting with low-residency online programs in professional schools and they are having real success, which is driving some rethinking about what we need to be doing to improve our core product. At Dartmouth, it's a quality play. We want to bring new techniques into residential teaching but also create sustainable programs."

To the extent that this shift in emphasis from online learning to digital strategy can produce sustainable programs of enhanced quality, we can undoubtedly expect to see more institutions pursuing the path of learning design informed by digital experimentation.

While it may yet be too early to say for sure whether this shift will be long lasting, if it is, we should expect to see evidence of it in some very prominent places. As DeVaney put it, "I think we'll know if this shift is real when we see more institutions differentiating around this. Hopefully we'll see mission statements that look different, too."

Kathleen Ives, chief executive officer of the Online Learning Consortium, agrees, noting, "Digital is becoming mainstream. But for an institution to succeed it has to be part of their vision and mission and has to permeate across their organization."

Bell at Northeastern argues that truly effective digital strategy will have to go a step farther even than connecting diverse institutional activities.

"Digital leadership should not just be about harmonizing initiatives," he said. "It should also be about harmonizing our messaging and conveying our unique philosophy to the communities we serve -- and at Northeastern, the emphasis is on online experiential learning."

In other words, the shift to digital strategy will only be significant if it enables institutions to not only think and teach differently, but also to talk more effectively about who they are and what makes them different at the very core. ∎

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Learning Analytics in a Liberal Arts Context

Three thoughts on how to proceed.

BY JOSHUA KIM

How many times in the past couple months have you had discussion about learning analytics and big data on your campus?

I've been thinking about how to think about learning analytics and big data in from a liberal arts point of view.

Do liberal arts institutions think about learning analytics and big data in a different way than our colleagues at larger research focused institutions and/or community colleges?

What is the community of practice around learning analytics in the liberal arts?

If you haven't read Malcolm Brown's excellent article in EDUCAUSE Review - *Six Trajectories for Digital Technology in Higher Education*, I highly recommend you check it out. Malcolm has a bunch of interesting points to make, including some thoughts about the importance of learning analytics. Malcolm writes:

"...the analysis of ever-increasing amounts of data and the increasing influence those analyses have in the conduct of higher education. This use of "big data" affords much more nuanced and timely insights into all kinds of learning processes. It enables the creation of custom reports tailored to specific learning contexts, ranging from institutional dashboards to personalized assistance for learners. It provides the basis for measuring progress toward institutional strategic goals. Equally important, analytics enables interventions in nearly real time. This contributes greatly to learner and instructor success, as it allows the institution to assist students at the very moment they are falling behind."

How would we rewrite Malcolm's synthesis of learning analytics and big data for a liberal arts context?

Thought #1 - Focus First on Our Goals:

Whenever I talk about digital learning I never start with the *digital*. The focus is always on the learning. Digital is a tool, a mechanism, and a bridge that will ideally help us to reach our real goals around learning.

My thinking is that we should think and talk about learning analytics and big data in much the same way as most of us talk about other educational technologies. We should be clear about our values and our objectives. We should be the first to be critical of the use of learning analytics and big data in cases where investing in these methods and technologies do not support our core goals.

In the liberal arts context, our core educational values are about developing critical thinking and leadership skills. Liberal arts institutions privilege a relational model of teaching and learning. Intensive, rigorous, persistent, and consistent interactions with educators are at the core of the liberal arts learning experience. We strive (I'm not saying we always succeed) to build an educational ecosystem that nurtures passion, vision, ethics, and a sense of responsibility. Learning a body of knowledge and a set of skills is an important element of a liberal arts education. This acquisition of skills and knowledge, however, is in the service of larger educational aims.

It is not immediately obvious exactly where learning analytics and big data can be applied to advancing the core values of a liberal arts education. Analytics depends on measurement. How do we measure judgment, honesty, bravery, integrity, and wisdom? The first step, I think, is to have an honest discussion about our goals - and about the potential (and limits) of analytics in reaching them. It may be that our analytics are more about inputs than outputs. Our unit of analysis may need to move from the individual learner to the class or the program. We may need to work harder to capture data from sources that are non-obvious. A longitudinal approach may be necessary. The key is to get

the conversation started.

Thought #2 - Create a Culture of Evaluation and Assessment:

Interest in learning analytics and big data offers an unparalleled opportunity to get a campus discussion going about evaluation and assessment. This is a discussion that has so been less than pervasive at every level of the typical liberal arts campus. The professionals in the institutional advancement offices and teaching and learning centers have been talking about learning evaluation for many years. Creating productive discussions about evaluation and assessment through-out the larger campus is community is, however, made more difficult as issues of grading and course evaluations often get put into the mix.

Dartmouth classroom

The excitement around learning analytics provides a terrific opportunity to reset the debate around assessment. We can, hope-fully, move away from a discussion of specific meth-ods - and more towards a conversation about how we can create a culture of assessment on our campuses. All this really means is developing a commitment to make decisions with the benefit of evidence. Teaching and learning decisions shouldn't be any different. No professor would argue for a research agenda that was not built on hypothesis testing. The opportunity here is to bring some of the same methods and cultural orien-tations that are normative in research to learning.

Thought #3 - Build New Competencies and Capabilities:

The third area where I think investment in learning analytics makes sense in a liberal arts context is in building new institutional competencies and capaci-ties. Most colleges have quite strong institutional an-alytical capabilities. Tasks ranging from accreditation to enrollment management require the ability to track, manage, and add value to data. Research Computing divisions have long partnered with faculty to work with big data for in a range of scholarship activities.

What is potentially new in the liberal arts context is the use of these analytical methods and techniques for the direct promotion of student learning. What is necessary, therefore, in building up capacities in learning analytics is to develop institutional connectors. Someone has to connect faculty engaged in inquiry on student learning to re-sources and expertise in the Institutional Ad-vancement, Research Computing, and other divisions. Campus pro-fessionals who have not been traditionally pulled into the scholarship of teaching and learning (SOTL) need to add this work to their portfolios.

Developing capabilities and competencies in learn-ing analytics also represents a shift to how institutions view their learning technology platforms. The learn-ing management system (LMS) and the media man-agement system (MMS) are rich sources of potential learning intelligence. How learning data from these platforms is collected, analyzed, synthesized, shared, and presented are suddenly key concerns. Data that is not shared is not useful. Analysis efforts that are not grounded in theory and based on hypothesis testing will quickly devolve into fishing expeditions.

Every campus, and in particular liberal arts institu-tions, needs to evolve the teaching ecosystem to in-clude the utilization of analytics to improve learning. ∎

Joshua Kim is director of digital learning initiatives at Dartmouth College.

The Problem With Longitudinal Data

The need for timely information.

By Matt Reed

This may be the unsexiest title ever, but the subject matters.

This week we got the latest data on our six-year student success rate. It's supposed to tell us how we're doing, and in a global sense, it does. But it has a glaring flaw that reduces its usefulness in driving change, and renders it absurd for use in performance funding.

It's at least six years old.

In fact, it's slightly older than that, due to the delay in gathering data. Which means that we just got numbers for the cohort that entered in the fall of 2007.

People who study retention data insist that the lion's share of attrition happens in the first year. That means that the hot-off-the-presses numbers we're getting now are mostly reflective of what happened in the fall of 2007 and the spring of 2008. That was before the Great Recession, the enrollment spike of 2009-10, its subsequent retreat, and the largest wave of state cuts in memory. It reflects what was, demographically, a different era. And it misses everything we've done in the last six years, since someone who dropped out in early 2008 missed the innovations introduced in 2010 or 2012.

In other words, as a reflection of what we're doing now, it really doesn't help.

It's possible to get much more recent data, of course, but it's necessarily partial. In any given year, indicators can point in seemingly contradictory directions; the underlying picture may not become clear until long after it has ceased to be useful. The owl of Minerva spreads its wings at dusk, by which time it's too late.

From a system perspective, longitudinal data has real value. It can serve usefully as a reality check or a diagnostic, especially when the data are chosen to reflect a sound theory. For example, I'm a fan of the surveys that show the percentage of state university grads who have some community college credits. The percentages are so much higher than cc grad rates that they strongly suggest that we're asking the wrong questions. They don't shed much light on individual campuses, but they strongly suggest that the ecosystem is more than the sum of its parts. We'd be wise to keep that in mind when having discussions of, say, funding policy.

But drilling down from a long-term systemic view to a single campus and year-to-year variations in funding is problematic at best.

On campus, it's difficult to run "clean" experiments, since we can't isolate interventions. In any given year, we're trying multiple things, and the external environment is changing in a host of ways. Did a one-point gain last year reflect a policy shift, a demographic shift, better execution, or random chance? It's hard to know.

Has anyone out there found a really good, really early indicator that's actually useful in improving institutional performance? Right now, we have to choose between timely and good, and that's a frustrating choice. ∎

Matt Reed is vice president for learning at Brookdale Community College.

Competency-Based Education 2.0

Definitions, values and analytics.

By Steven Mintz

For years, accreditors, employers and a host of educational reformers have sought an outcomes-oriented education with explicit learning objectives and rigorous assessments to evaluate and certify students' knowledge and proficiencies. Convinced that grade inflation and a diluted liberal arts curriculum have eroded the value of a traditional college degree, a growing body of thought has come to favor an approach that emphasizes demonstrated mastery of essential competencies.

Why, then, has competency-based education – an educational model that places a premium on learning outcomes rather than class time – evoked a great deal of ambivalence among many observers? The answer, as my colleague Marni Baker Stein has explained, is because competency-based education lacks a commonly accepted definition.

Even a cursory review of articles or websites that describe competency-based education makes the jumble of definitions obvious.

According to the *Harvard Business Review*: CBE is an education geared to "the needs of the workplace." Its modularized approach to education breaks free of the course and the credit hour as the primary units of teaching and learning. It holds out the prospect of accelerating the pace of education by awarding credit for prior learning.

In every example cited by the *Harvard Business Review*, the educational experience is self-directed and self-paced and delivered entirely online. In most cases, it's offered through a subscription model that allows students to take as many assessments as they can during a particular term.

It is this conception of competency-based education that has provoked a backlash from those who fear that this approach is at odds with the goal of a liberal education: To produce graduates with a well-rounded education that places a premium on critical thinking,

written and oral communication, and fluency in an array of disciplines and methodologies.

But an outcomes-driven education need not be fully online, self-directed, self-paced, or narrowly skills-focused.

Rather than conflating competency-based education with any online approach that grants credit based on tests, papers, and projects rather than seat time, it is better to focus on CBE's fundamental characteristics. It is an approach to teaching and learning that:

- Emphasizes transparent, measurable learning outcomes and demonstrated mastery of the skills and knowledge.
- Offers an intentionally designed curriculum with a carefully considered sequence of learning experiences; and
- Embeds demanding assessments to ensure that students can demonstrate their mastery of a wide range of skills and knowledge.

The University of Texas System campuses are implementing an approach to competency-based education that differs fundamentally from that offered elsewhere.

Our approach:

Is career aligned, but isn't job training.

Rather than offering a vocational education or narrow technical training, our CBE approach instead emphasizes a grounding in the liberal arts, with a particular emphasis on written and oral communication skills, contextual thinking, moral reasoning, and policy analysis; professional identity formation; and a broad range of employment outcomes.

Thus our BS in biomedical sciences includes a core curriculum that incorporates clinical writing, narrative medicine, the history of medicine, disease, and public health, medical ethics, and health care policy. The
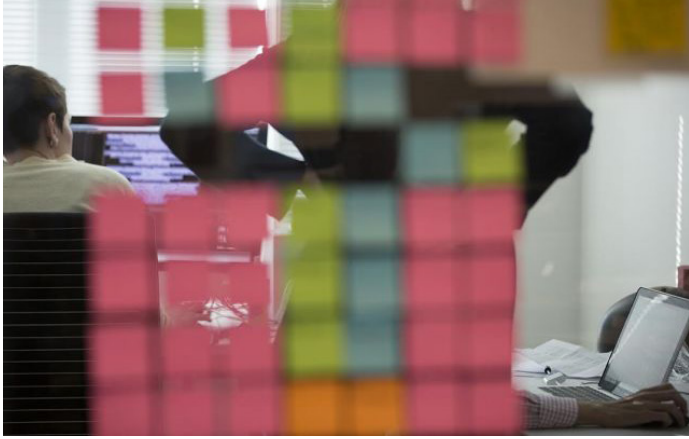
program might lead to medical school, but also into nursing or health informatics or health administration, among other fields.

Rests upon a backward designed sequence of courses developed collaboratively by teams of faculty.

Faculty -- including faculty from our graduate and professional schools -- blueprint all aspects of the learning experience from the curricular level to the course and module level. They think about the curriculum as a vertical that builds in a logical sequence over time, from secondary school through postsecondary education and beyond.

The faculty, in association with professional associations and industry, identify the learning goals, the topics to be covered, and the activities and projects, and work with assessment specialists inside and outside our system to insure that students achieve a minimal viable competency along every program dimension.

Our CBE program accelerates time to degree not by awarding credit for prior learning or life experience, but by optimizing the curriculum-eliminating redundancies and aligning assignments, readings, and activities.

Is cohort based and course-aligned.

Students traverse our degree programs in the company of peers and meet at least one day a week in a classroom setting with faculty. As members of a "learning network," our students get the advantages of face-to-face interaction.

Because competencies are aligned with traditional courses, students receive two transcripts -- a competency transcript that clearly identifies the proficiencies they have achieved, and a traditional grade and course transcript, necessary if students seek to transfer or apply for admission to a graduate or professional school

Adopts a hybrid approach that combines the advantages of personalized adaptive learning and a traditional course schedule.

The online component of our courses is personalized and adaptive. Embedded diagnostics identify student strengths and challenges and adjust the student's learning pathway to remediate deficiencies. Our technology infrastructure can also tailor readings and activities to particular students' interests and learning needs.

Unlike self-paced, self-directed approaches to learning, our faculty establish clear timetables to ensure that students remain on track.

Emphasizes interactivity, real-world projects, and powerful social experiences.

To reinforce high levels of engagement, students do not simply view video-recorded lectures or review static websites; instead, they take part in active learning activities and undertake career-aligned projects, including, where appropriate, fieldwork and clinical, laboratory, and research experiences. The social dimensions of our programs include team-based learning and opportunities for collaboration.

Harnesses the power of data analytics to boost graduation rates.

Advanced data analytics flag students at-risk of failure, help faculty personalize instruction, strengthen advising, and allow institutions to continuously improve teaching methods and student support services.

CBE can be a game-changer, especially for those students who historically have been poorly served by higher education. It can increase engagement by providing projects and activities that students find meaningful and relevant and by offering degrees with a clear

value proposition. It can streamline the path to a degree by eliminating wasted credit hours.

But for competency-based education to be truly effective, it is essential to move forward on multiple fronts. We need high impact program designs that offer personalized learning pathways, a high degree of interactivity, state-of-the-art content, and powerful networking and collaborative experiences. We need 360-degree individualized student support, including

instructional facilitators who can provide the mentoring that too few students currently receive. And we need new technologies to power next generation pedagogies and forms of education research previously impossible.

Competency-Based Education can produce unprecedented gains in access, affordability, and student success.

The challenge is to do this right. ∎

Steven Mintz is executive eirector of the University of Texas System's Institute for Transformational Learning and Professor of History at the University of Texas at Austin. Harvard University Press is publishing his latest book, The Prime of Life: A History of Modern Adulthood.

Has Higher Ed Peaked?

Bryan Alexander suggests a thought experiment on trends
that suggest tough times ahead for most colleges and universities.

By Bryan Alexander

American higher education now seems to be recovering at last from the 2008 financial crisis. Some states are increasing their support for public universities and colleges. Backlash against the impact of budget cuts seems to have the idea of austerity down a peg, if not discredited it entirely, which might free up more budgetary room for governmental support of education. On the private side, institutional endowments are finally rising after years of stagnation and decline. Domestically, American college graduates still enjoy higher lifetime earnings than those with only high school experience. Internationally, the number of students traveling to study in the United States continues to grow.

But what if these cheerful data paint an inaccurate picture? What if a battery of other data points, driven by powerful forces, exerts pressure in the opposite direction, pushing American colleges and universities into contraction? Much like "peak car," the demand for

higher education may have reached an upper point, and started to decline. Like peak oil or peak water, it's becoming more expensive and problematic to meet demand. As a thought experiment, let us examine these forces and consider this possible scenario under the header: Peak Higher Education.

The very idea is retrograde, as American higher education has enjoyed a growth pattern stretching back more than a century. In the 19th century the Morrill Act established land grant institutions, massively increasing the number of students and expanding the breadth of social class in higher education. The adoption of German research university models built up scholarly capacity and graduate programs. The World War II-era G.I. Bill sent an extra generation or two to college and helped lead to the creation of many community colleges while the Cold War's Sputnik spurred a renaissance in university-based scientific research.

Data, Analytics and Student Learning

Starting in the 1960s enrollment grew even further under the impact of two coincidental drivers: outreach to previously underserved or excluded populations, especially women, racial minorities, and the poor, and a boom in creating new campuses. Managing these changes expanded and professionalized administrations and support staff. The post-Cold War drive to get even more high school graduates into college to take advantage of the "college premium" on lifetime earnings added yet another layer to the enrollment cake, with adult learners constituting an ever-growing slice.

So if the big picture is of persistent growth over the long haul, of increasing numbers of campuses, instructors, researchers, administrators, support staff, undergraduates, and graduate students, how can we speak today of an apparently sudden reversal into decline?

To start with, the number of students enrolled in colleges and universities has been in broad decline over the past two years, despite the growth in America's total population. Last fall the majority of admissions officers reported challenges in making their baseline targets. Census data back up these professional assessments, identifying an especially pronounced decline in the for-profit sector, but also clearly visible in both two-year and four-year public institutions. Even private four-year baccalaureates barely show a plateau. This decline hit both undergraduate and graduate student populations.

Perhaps the labor market's gradual recovery is partially responsible for this decline. After years of high unemployment drove some workers back to school, a portion of them have left campus for work. Maybe some older nontraditional students have chosen neither schooling nor work, but retirement. Alternatively, still others have simply chosen to stay at home, refusing both formal work and study. Whichever reason or reasons lie behind this aggregate shift, colleges and universities now deal with the results.

While fewer Americans are now attending higher education, we also spend less on tuition and other costs. The recent recession and slow recovery obviously play a role here, as do the longer trends of stagnant family median income. Possibly some students have down-shifted their institutional expectations in order to save costs, preferring a community college to more expensive state university, or online degrees to those from brick-and-mortar institutions. Staying close to home can save residence hall/apartment costs. For whichever reasons, tuition-dependent colleges and universities are suffering a decline in their main income stream. The majority of campus chief financial officers see serious sustainability issues unfolding.

Looming over all of these developments is the double whammy of debt and un(der)employment. Ever since 2008's financial crash, traditional-age college graduates in their 20s have entered a very challenging labor market, all too often facing underemployment or unemployment. "Boomerang children," graduates who return to their parents' homes in order to survive or save money, are now features of our cultural landscape.

The majority of those graduates also carry a growing debt burden. While media accounts can overstate the student debt specter (about one-third of students graduate without borrowing at all), the total amount of debt continues to grow to unprecedented levels. Individual debt approaches $30,000 per loan carrier, while total American student debt blew past one trillion dollars. Also daunting is the policy by which student loans are, unlike most other forms of borrowing, undischargeable by bankruptcy.

Taken together, the challenge of carrying that debt into a still-difficult job market may well drive a good number of Americans to new behaviors. Many are likely to delay major life decisions, such as getting married, having children, or buying a house, with cultural and economic impacts just starting to be felt. Some may see their lifetime earnings depressed by having a slow start. In a telling response, several major banks have ceased growing their student loan operations, while one publicly states that new loans will no longer be profitable. Perhaps the financial industry is signaling that higher education's debt-fueled finances have reached an upper limit.

Behind these economic and enrollment decisions lies an even greater force, the demographic decline of American children and teens. The number of minors, especially in the Northeast and Midwest, has been decreasing for several years. This has already impacted K-12 student populations, a fact well known to parents, school boards, and state planners. In turn such a shrinkage threatens to tighten the traditional-age undergraduate pipeline, which is already being squeezed by enrollment and financial support problems.

At the same time recent changes in student demographics have added to institutional costs. An increasing number of undergraduates are first-generation students, sometimes requiring extensive support or remedial help. The growing number of learning disability diagnoses, partially driven by poverty and/or poor health, has similarly boosted campus support expenditures. Student life programs and campus amenities have grown at many institutions, in part to compete for that slipping number of undergraduates. Looked at in this light, American higher education as a whole may be teaching fewer students than before, and they might be more costly to instruct. And the same is true for public institutions that may have few luxuries but haven't been given the funds to keep up with past demand for instructors, space and student services.

Naturally this places upward pressures on tuition and other fees. If we press on the peak model, these students are well-suited for the downward slope, being more difficult to work with than those on the upside.

If this description of peak higher education is correct, then many recent decisions by colleges and universities make new sense. Campus mergers are logical strategies if those institutions deem they have grown class capacity in excess of what is and will be needed for a dwindling number of students. Similarly, some institutions have announced the closure of entire departments, even in core curricular areas like math and literature. Elsewhere I've dubbed this "the queen sacrifice," using the desperate chess metaphor to catch the importance of cutting at the heart of a college's academic mission. With such sacrifices come concomitant reduction of support staff, and laying off of faculty, both tenured and adjunct.

These campuses simply see themselves as cutting back in response to a shrinking market. The same goes for administrations deciding to shift resources to high-enrolling majors and programs: aiming to catch increasing numbers from a dwindling group. These strategic choices may signify institutions coping with finding themselves on the downward slope of a recently-passed peak.

If this peak higher education model offers an accurate assessment of the current situation, what does the future hold? Unfortunately, we may expect more of the same: mergers, layoffs, closures, further adjunctification of the professoriate. Curriculums might change, shifting towards programs winning larger numbers (STEM, health services, business, hospitality, criminal justice), and moving away from their opposites (the arts and humanities, all too often). The human costs of these institutional strategies will grow, as instructors lose jobs and current students see programs disappear.

The number of graduate students could drop in those de-emphasized fields. Alumni and other stakeholders may resent seeing a beloved campus change from its pre-peak character. Beyond the campus popular dissatisfaction with higher education could grow. That could take the form of more potential students opting out of college, or a return to vocational training in K-12 and adult learning.

Moreover, competition for a smaller student pool will

increase. Admissions offices will deploy data analytics and social media analysis to fight for scarce American teenagers. Some institutions may increase student support and amenities, while others reduce them to offer a cut-price education. We can imagine more universities opening up recruitment and branch campuses abroad, especially in regions combining large populations with economic growth. As one economist put it, some campuses may well become "(Partially) a Finishing School for the Superrich of Asia," using international populations to make up for a national shortfall. The American campus to come may well be more global than it currently is.

To sum up: higher education has overbuilt capacity for a student demand which has started to wane. America has overshot its carrying capacity for college and university population, and our institutions are scrambling for strategic responses.

Where and when do these post-peak strategies end? Demographic and economic rebounds seem necessary. The youngest generations may increase their child-bearing numbers, although that will take 20 years and more to be felt in higher education. Closer to the present, immigration growth may supplement the national teen shortfall. The American economy may return to significant growth at or better than pre-2008 levels, encouraging families and government to invest more in colleges and universities.

In other words at some point institutions may have the opportunity to reduce these cutting and competitive strategies. Corrections may slow down and cease, leaving us with a smaller higher education sector as compared to its 2011 peak. There will be fewer students and faculty, but the decline will have ceased.

All of this is a thought experiment, not a prediction of a likely or desired future. The peak model may founder on emerging developments, such as a popular resurgence in support for higher education, or the appearance of hitherto unused cost cutting measures or a major growth in nontraditional age enrollments. Instead of a major peak, the data touched on in this article could represent only a blip or hiccup in a continuing story of American higher education's growth. But until such developments emerge, we should consider the peak higher education explanation of real data and present trendlines. It is, at least, a provocation to get us thinking about campus strategy in new, if darker ways. ∎