Blockchain technology could offer a more learner-centered alternative to traditional credentialing.

A tool at North Carolina State U allows students to follow their own paths through coursework.

Michigan's Oakland University shares how it's tackling user demand, the Internet of Things, signal management and more.

What happens after a struggling student is flagged "at risk"? Two institutions explain how they have fine-tuned their intervention strategies.

Longtime chief information officers reflect on how their day-to-day activities have changed and what skills are most important for today's IT leaders.

We honor 11 institutions using technology in innovative ways to improve teaching, learning, administration and operations in higher education.
CT Innovators Honorable Mentions
Gleaned from this year’s Campus Technology Innovators award nominations, these 8 projects are making strides in virtual reality, synchronous online learning, digital literacy and more.

CALL IT AN EDITOR’S PRIVILEGE: While the Campus Technology Innovators awards do not have a formal category for honorable mentions, each year I am inspired to put forward my own list. So here, in no particular order, are eight projects worth knowing about, Innovators award or no:

- **Oklahoma State University**’s state-of-the-art Mixed Reality Lab focuses on research and instruction in augmented reality, virtual reality and digital prototyping — and provides students with the tools to develop design projects along the reality-virtuality continuum.

- An e-portfolio initiative at **Arizona State University** has digitized the process for students to consent to donate their work to research, streamlining researchers’ access to a large repository of student work for use in journal publications about student learning.

- **UC Berkeley** created a synchronous online learning platform that goes beyond “live lecture,” allowing remote students to participate in classroom activities with a realistic sense of “being there.”

- **Oral Roberts University**’s GeoVision Technology initiative integrates wearable, mobile and cloud-based technologies to support the school’s philosophy of holistic education.

- **Taylor’s University** in Malaysia created a teaching evaluation tool that provides instructors with a granular view of their performance and uses data to identify areas for professional development, all geared toward improving the student learning experience.

- **Wayne State University**’s home-grown Academica portal incorporates social networking tools that enable two-way communication and collaboration, creating a true “meeting spot” for the campus.

- Looking for ways to improve the student and faculty experience within the classroom, regardless of location, **DeVry Education Group** created the Connected Classroom, an immersive learning platform that connects multiple locations for onsite and remote students, providing simultaneous instruction and live collaboration to enhance learning.

- **Clemson University**’s Adobe Digital Studio gives students, faculty and staff complete access to Adobe’s Creative Cloud. Students gain exposure to and competencies in tools for video production, digital content creation and more — digital literacy skills that are becoming critical to success in the 21st-century workplace.

Thank you to all who submitted award nominations this year. For more information on the Innovators program, visit campustechnology.com/innovators. CT

Congratulations to our 2016 Campus Technology Innovators! (See page 28.) Many of this year’s awardees will be presenting in a poster session on Wednesday, Aug. 3 at Campus Technology 2016 in Boston.

Continue the conversation.
E-mail me at rkelly@1105media.com.

Rhea Kelly, Executive Editor
AIRBNB FOR CLASSROOMS. “In a world where we can place people in empty seats in cars and empty beds in houses, why not place people in empty chairs in college classrooms?” That’s what a team of Harvard University (MA) students say about their new start-up called ALEX (Anyone’s Learning eXperience). The idea behind ALEX is this: Universities and colleges with empty seats in some of their courses make those available through the site, and employers that want employees to obtain continuing education can subsidize enrollment for their people. The platform matches company need with excess classroom capacity. The site earns a commission for every student it places, and most of the fee goes to the institution delivering the course. Read the full story online.

STUDENT SUCCESS RESEARCH. The University of Michigan is self-funding two new research projects that explore student success. One will examine the ties among students’ personal attributes, such as values, beliefs, interests, behaviors and backgrounds, and their success in school or overall sense of well-being. The other will attempt to build a holistic model of student success through students’ written work, behavioral data and institutional data. Both multi-disciplinary projects will receive $1.25 million in funding from the university’s Michigan Institute for Data Science, which runs a challenge initiatives program that encourages data scientists to work with subject-matter experts to tackle problems in learning analytics, transportation, personalized medicine and health, and social science. Read the full story online.

GOOGLE GRANTS. A new Google Cloud Platform Education Grants program is offering free credits for computer science educators to use Google Cloud Platform products. Anyone who teaches computer science or related subjects can apply; once approved, credits can be used anytime throughout the upcoming academic year. In addition to credits, the program provides a set of resources to help implement Cloud Platform products effectively in curricula. Read the full story online.

LECTURES ON DEMAND. Instructors at USC’s Keck School of Medicine now have a new resource for flipping the classroom. Using Wirecast streaming production software from Telestream, the institution’s Preventive Medicine Soto Studio is creating about 20 finished hours of HD video lectures and webcasts per week for the Master of Public Health Online Program as well as other departments. Wirecast’s video production tools enable users to switch between cameras; key in graphics on a greenscreen; incorporate program opens, closes and music tracks; create real-time transitional effects; display titles, lower third supers and full-screen text; and more. Read the full story online.

3D PRINTING GROWTH. According to a report from International Data Corp., the U.S. 3D printing market grew by nearly 20 percent in 2015 compared to 2014. That increase is expected to continue through 2020, with a compound annual growth rate of more than 16 percent. And in the education segment specifically, IDC forecasts that 3D printing spending, which includes printers as well as materials and software, will grow from around $200 million this year to more than $500 million in 2019. Read the full story online.

MOBILE ENGAGEMENT. Enterprise cloud venture studio High Alpha has announced ClearScholar, a new cloud-based technology company developed in
partnership with Butler University (IN) that aims to improve student success through personalized mobile engagement. The ClearScholar platform will "provide students personalized news and information feeds, unified calendaring with tailored events, instructor and university-driven polling, location-aware and emergency notifications, and a secure mobile student identification," according to a press release. The technology will track student interactions and engagement, allowing administrators to target their efforts to increase student satisfaction and success. Read the full story online.

E-LEARNING SUBSCRIPTION.
eCornell, Cornell University's (NY) online learning unit, now offers a monthly subscription service that features presentations and interactive discussions led by university faculty. Read the full story online.

PRODUCT ROUNDUP

The new KU12000 installation projector from Ricoh offers WUXGA (1,920 x 1,200) resolution, 12,000-lumen light output and a 5,000:1 contrast ratio. Read the full story online.

Altia Systems’ PanaCast 2 Huddle Room Solution includes a PanaCast 2 video camera; Intel NUC or Compute Stick PC; USB speakerphone; and wireless keyboard. Read the full story online.

Vaddio’s RoboTrak presenter tracking system uses infrared technology, rather than audio or facial recognition, to follow instructors or presenters as they move around a room. Read the full story online.

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and industry experts. The WebSeries service is the latest addition to eCornell’s portfolio of online professional courses and certificate programs. Currently, WebSeries has channels on entrepreneurship, human resources and women in leadership; subscriptions are available per channel at $39 per month and $279 per year. Read the full story online.

BLOCKCHAIN CREDENTIALS.
The MIT Media Lab’s Learning Initiative has partnered with Learning Machine to release the initial version of an open source project designed to build an ecosystem for creating, sharing and verifying education credentials based on blockchain technology. Using the Bitcoin blockchain, the certificates can be shared with anyone who requires documentation by simply sending a link; future versions will add features to improve real-world usability, such as versioning, revocation, cohort issuance, document encryption and cost reduction. Read the full story online.
How Blockchain Will Disrupt the Higher Education Transcript

Blockchain technology could offer a more learner-centered alternative to traditional credentialing.

LAST YEAR, the MIT Media Lab began issuing digital certificates to the participants in its Director’s Fellows program. The authentication behind the certificates relies on blockchain technology, best known for its connection to the cryptocurrency bitcoin.

In a blog post, Philipp Schmidt, director of learning innovation at the Media Lab, described how blockchain works: “In essence, it is a just a distributed ledger to record transactions. What makes it special is that it is durable, time-stamped, transparent and decentralized. Those characteristics are equally useful for managing financial transactions as for a system of reputation. In fact, you can think of reputation as a type of currency for social capital, rather than financial capital.”

The technology has tremendous potential for higher education, according to Phil Long, chief innovation officer and associate vice provost for learning sciences at the University of Texas at Austin. In a recent Future Trends Forum video chat hosted by consultant and futurist Bryan Alexander, Long pointed to credentialing as an obvious first place to apply blockchain in higher ed.

A Learner-Centered Transcript

A transcript is the record of what a student has accomplished at a university. The document is managed and controlled by the institution, not the student. In contrast, Long said, blockchain has the potential of providing an immutable record of an individual learner’s accomplishment that can be disclosed in a public context. “The single thing that attracted me most is the potential it has to reaffirm the learner’s ownership of their own record,” he said.

Today when you get a credential from an institution, you receive a piece of paper, but ultimately anybody who wants to verify that credential goes back to the source. Yet new models of higher education are complicating that process, Long pointed out. “The notion that you will go to one university for all the training you need for your career is quite passé. In the future, many learners will have earned credentials from a range of institutions,” he said. For anyone to validate those records, they are going to have to go back to every single source. “Is [blockchain] a way that that
kind of intermediary chain can be broken?” Long asked. With blockchain technology, he said, “the assertion of the authenticity is made at the time it is created; there is no need to validate it thereafter.”

Blockchain is scaring a lot of people, he added, “because its fundamental characteristic is the elimination of intermediaries — which is one of the reasons the financial industry became so excited when bitcoin was created.”

New Types of Learning
One forum attendee asked Long if blockchain could help provide credentialing for MOOCs and other types of learning outside brick-and-mortar institutions.

If an institution is confident in asserting that the individual who has completed a MOOC has achieved certain accomplishments, the answer is absolutely yes, Long said. “The learner could have a record of their learning from MOOCs, professional development activities and universities.”

Extending the idea further, Long referenced the work of a colleague from France, Serge Ravet, who suggests blockchain could be used to exchange social capital among individuals. For example, he said, the Future Trends Forum is a kind of learning community. “If you are getting value out of the way in which Bryan Alexander has pulled together members of the community in these sessions, in Serge's view, you would have a Twitter-like application where through the hashtag you could offer to Bryan a social piece of capital that says 'I valued this interaction' and it would go into Bryan’s blockchain.” And there would be an accumulation of that chain of affirmation and reputation that he would accrue — in essence the community validating itself. “That is sort of the anarchistic extreme of this idea,” Long said.
Managing Credentials
Another forum participant asked whether learners would have to create something like a bitcoin wallet to store and share their credentials.

With the blockchain environment as the back end of bitcoin, there had to be a place to put the digital coins, Long said — the bitcoin wallet. Likewise, in credentialing, it would be useful to have a place to store credentials. “You could call that your wallet or learning credential store or portfolio,” he said. “In the same model as bitcoin, every single learner would have one of these. In fact, ultimately, you would have one running on your phone and have your learning credentials with you at all times.”

There were also questions raised about privacy and visibility. Long said that although users wouldn’t be able to alter the contents of the learning record, you could decide which pieces of it you want to share with which audiences.

“People are thinking of extending this to an application environment that would add granularity and control over how you display things,” he said. “But it is not editable. That is one of the big philosophical issues about this methodology. In the European Community, that would represent a real problem; I suspect, because in the European Community they believe in a right to anonymity and the right to choose what about [a person’s] past record should be visible,” he said.

“The philosophy of the blockchain environment is that you can write a block that supercedes a prior block, but you can’t change history,” Long said. “Whatever is in your record … is a validated occurrence and you therefore can’t delete pieces of history you don’t like anymore.”

“The philosophy of the blockchain environment is that you can write a block that supercedes a prior block, but you can’t change history. Whatever is in your record … is a validated occurrence and you therefore can’t delete pieces of history you don’t like anymore.”

Getting Started
Participants asked Long how universities could get started with blockchain. “It is very germinal right now,” he admitted. So far, most of the development work in the field has been transparent and in open source communities by organizations such as Ethereum and the Linux Foundation. The simplest way to start is to pick a blockchain environment; download and install it; and get a feel for what it consists of. “Right now it is pretty technically challenging,” Long said. He and a colleague downloaded the Ethereum environment, they had it up and running in two days and have been playing with it ever since.

In terms of higher education credentialing, he noted, a group of registrars is following this environment, led primarily by Tom Black at Stanford University (CA) and Shelby Stanfield at UT-Austin.

David Raths is a freelance writer based in Philadelphia.
A Moodle Plug-in for Gamified, Individualized Learning

North Carolina State University has developed a gamification tool that allows students to follow their own paths through coursework.

At North Carolina State University, instructors can turn their courses into a personalized game, where students complete course activities in the school’s Moodle learning management system to gain skill points and advance their avatar through a series of objectives. The technology behind the game is a Moodle plug-in — developed in-house at the university — that allows each student to pursue a different path through the coursework. After three years of work, the development team is preparing to release the plug-in to the Moodle open source community as early as fall 2016.

How It Started

As an assistant teaching professor of sport management at NC State, Edwin Lindsay has seen plenty of freshmen and sophomores gunning for a career as a general manager of a major sports team, commissioner of the National Football League or another one of the “sexy” jobs in sport management. But those jobs are few and far between, and the reality is that very few sport management students will ever reach those positions. “We wanted them to understand that although those are awesome jobs to have, there’s only one of them,” said Lindsay. “There are a lot of other jobs that are available to people who are interested in the management of sport that they are not even considering, at least at an early stage in their careers,” he said.

Lindsay wanted to help students in his Introduction to Sport Management class discover those other jobs, and at the same time he wanted to help them discover which career path might suit them best. By pointing his students in a realistic and suitable career direction at the beginning of their university program, he hoped to help them avoid disappointment down the road. “The end game for us, as far as the design of the course and using gamification, was to really focus on helping students make better decisions about their careers early,” said Lindsay. “If they do that, they can begin to craft almost an individualized experience, so they’ll be much better prepared for that next step in their career once they finish their degree here at NC State.”

Lindsay and his colleague, Michelle Harrolle, who was an assistant professor at the university until 2013, originally planned to gamify one unit in the course that focused on careers in sport management. They applied for a grant
management course, they complete a “pre-game warm-up” activity, including a modified Myers-Briggs personality-type indicator test, which reveals a little bit about how they perceive the world and make decisions. For example, students find out whether they are introverted or extroverted and what that could mean for themselves and their future career. They also indicate their top three career choices within the sport industry.

Students then receive an avatar, which is the in-game character they will play as throughout the course. Each avatar has a cartoon-style profile picture, name, Myers-Briggs personality type and personal history. Students select a target job for their avatar, and each target job requires a particular skill set. Based on a student’s personal history, the avatar may already have acquired some skills. For example, if the avatar’s personal history includes being the leader of the high school debate team or a high school athlete, that history will be reflected in the avatar’s skill set. As students complete course activities in Moodle, they gain points in skill areas to advance their avatar.

The gamified course includes about 75 activities, five of which are required. Every student has to do a manager interview, volunteer experience, a midterm exam, a final exam and develop a personal career plan at the end of the course. All other activities are based on the student’s chosen career path. If a student wants to get the job of high school basketball coach, the game presents him or her with a mock job description including a list of required skills. Students have to achieve a certain number of in-game points in each of those skill areas to get the job.

“What I found in the class is that students are willing to do things that they would never try in real life under the auspices that this is a game, and all they have to do is to reset the avatar and pick up and start over again,” said Lindsay. “That’s one of the beauties of the game.”

Lindsay typically has about 100 students in his Introduction to Sport Management course, and grading the activities for that many students is a considerable amount of work. Lindsay always grades the five required assignments himself, and his graduate assistants help with evaluating the other activities. For activities that don’t count toward the students’ grade, Lindsay and his graduate assistants focus on giving the students valuable feedback. “If this were a decision that you were to make in the real world, if you’re thinking about this career, these are the implications that we see related to that decision,” explained Lindsay.

Supporting Individualization

Although the Introduction to Sport Management course is a high-enrollment course, Lindsay said that gamifying the course through the LMS has enabled him to create indi-
LEARNING MANAGEMENT SYSTEMS

vidualized programs for those 100-or-so students. “My students are required to do those five assignments. After that they’re choosing based upon their interest and what they think is necessary for them to get their avatar to the next stage in the game, so I’ve got one-third of my students that are doing one activity, another eighth of them that are doing another activity. It’s all over the board.”

The Moodle gamification plug-in takes advantage of the LMS’s built-in analytics features to help Lindsay identify struggling students at an early stage. “Because I’ve gamified my course, I’m utilizing those [analytics features] a lot more effectively, I think more so than they were intended,” said Lindsay. By tracking the number of times students have accessed the course material and how much time they spent on each unit, he said he “can almost predict how they’re going to perform on that quiz or that part of the midterm or that part of the final exam.” Once he identifies which students are struggling, he spends more time with them on the topics that are causing difficulty.

Lindsay encourages his students to pursue multiple in-game career paths. Because his original goal behind developing the game was to help students discover a career path that is realistic and suits their personalities and interests, exploring multiple career paths in the safety of a game environment facilitates that process of self-discovery. “If they come to the end of my course and tell me that they definitely want to continue to pursue the career or they have made the decision that this is one that they do not want to pursue anymore and they’re looking for alternatives, in my book that’s a win, as opposed to going through the entire course and feeling unsure about what they want to do.”

Leila Meyer is a technology writer based in British Columbia.
Getting Through a Wireless Overhaul

Michigan’s Oakland University is in the throes of its third major wireless network rollout in 10 years. Here’s how the institution is tackling user demand, the Internet of Things, signal management and more.

**OVER THE PAST**

A decade, campus WiFi has evolved from a network of convenience to a network of choice. Students, faculty and staff now bring a plethora of devices onto campus, many of which require a wireless connection. With ever-increasing demand for wireless connectivity and ever-changing WiFi standards, upgrading network infrastructure has become a virtually endless process complicated by ever-dwinding resources. Oakland University, a public university located in Rochester, MI, is currently in the midst of the third major overhaul of its wireless network and is tackling the challenges along the way.

**A Continuous Upgrade**

About 10 years ago, Oakland’s first wireless network consisted of a few locations around campus, with “wireless available here” stickers in case somebody urgently needed to look something up on a website or send an e-mail. The university gradually increased the number of those WiFi hotspots until they became pervasive across campus.

Over the last three to five years, wireless has surpassed wired as the preferred way to connect at the university. “People don’t want to visit the shrine of a desktop or even a lab computer or a stop-off station anymore,” said Theresa Rowe, chief information officer at Oakland. “They are carrying their computer in their hands with their smartphone, and they expect ubiquitous wireless access of a quality that is comparable to wired networking — and that really is the goal.”

The university’s original wireless network made it difficult to move around because people would have to reauthenticate their device every time they moved to a different wireless access point. The university’s second-generation wireless network solved that problem, but it couldn’t handle high densities of devices, such as in the student center or library.

For its third-generation network, the university wanted to provide pervasive high-density service, such as that of a hotel conference center or football stadium, but throughout the entire campus. The IT team sent out a request for information (RFI), considered several vendors, conducted some prototypes and then settled on Aruba.

The first phase of the project was to replace all of the wireless access points on campus, and then over the last six months, the university has been focusing on increasing the density in specific locations to support the idea of WiFi as the connection point of first choice. Rowe said the university is now one-third of the way into the high-density implementation and hopes to be finished with the high-use areas.
and the remaining low-use areas by June 2017. “And are you ever really done?” she mused. “Then we just start all over again.” Because wireless technology is always evolving, universities need to upgrade almost continuously.

Internet of Things
One of the biggest challenges Oakland University is facing with this wireless upgrade is figuring out how to deal with the exploding number of Internet of Things (IoT) devices on campus, which include everything from WiFi-enabled bathroom scales in dorms to surveillance cameras and automated parking lot attendants around campus.

“Onboarding sensors, devices and printers to a wireless network really forces you to rethink your onboarding process for connectivity,” said Rowe. “If you bring a laptop to our campus, that is going to be a smooth onboarding process that is self-driven by the person holding the laptop. But many of the other devices that come on require our hands-on intervention to get on the network.”

The university now has processes in place to handle onboarding IoT devices, “but it’s not as easy as if you have a device with a screen,” said Rowe.

In addition to the extra effort involved in authenticating a network device with no user interface, Rowe and her team need to figure out how to evaluate the security of those devices when they join the network, and she sees the need for a collaborative effort among higher education institutions. “I don’t think any one campus is going to be able to identify the definitive best practice here,” she said. “This is going to be a collaborative effort among all institutions.”

Signal Management
Wireless signal management, quality of service and reliability are an ongoing challenge for any WiFi network. Now that wireless has overtaken wired as the primary network, those issues have become a higher priority. “When wireless was the network of convenience, if there was a service interruption, we would just say, ‘You have to move your activity to a wired port and you’ll have reliable service,’” said Rowe. “But now with wireless as the primary service expectation, it has to have the same reliability of wired — and trying to achieve that is a real challenge, especially because it’s so dispersed.”

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Vasive wireless solution without fully considering what your management strategies are going to be for providing quality of service,” said Rowe. “And that’s very challenging when it’s ubiquitous and the network of first choice.”

Rowe brought in external consultants who were more experienced with quality of service standards. “I think checking your assumptions with a quality provider is essential,” she said. “You can’t assume that, ‘We’ve had wireless since 2008, and we know everything.’ This is an area that has evolved, and checking your assumptions with quality consultants is very useful.”

Staffing Challenges
One of Rowe’s biggest challenges during the current wireless network overhaul has been finding and keeping qualified network architects. Fifteen years ago, when wireless networks weren’t available throughout every campus, coffee shop and library, fewer jobs were available for network architects and managers. As the number, size and complexity of wireless networks has grown, the number of qualified professionals has not kept pace. There is now a shortage of people...
with those skills, according to Rowe. This shortage creates a bidding war for employers, and universities are losing that bidding war to corporations. “You’re competing with everybody for the talent to architect these environments and make sure that they’re running, and it’s very difficult,” said Rowe.

Oakland has mined its computer science program to help fill some of the gaps. “We hire a lot of student employees who are part of our engineering and computer science school,” said Rowe. “And we’re able to do that because the academic program is introducing topics and skills so we can then immediately hire them as student employees.”

However, those student employees are qualified to fill only the lower-level jobs, such as tier 1 network support. Eventually some of them gain enough education and experience to start doing project work, but the university still needs to hire professional staff to fill top-level positions — and that’s where staffing gets tough. Oakland University is part of the Merit network, a consortium of all of the public universities in Michigan that provides advanced professional development and training for network engineers, and Rowe has tapped into that network to help her professional staff advance their skills.

Looking Forward
Oakland’s current wireless overhaul project started in 2014, and Rowe anticipates that the entire campus will be upgraded to Aruba sometime in the next year. But when it comes to wireless networks, “there is no finish line,” Rowe said. “This is just an ongoing service that requires consistent management and evergreen refresh. We don’t try to do our entire campus at one time. We look at what we can do this year to move us to the latest platform. It’s cyclical.”

Leila Meyer is a technology writer based in British Columbia.
Student at Risk: Now What?
Retention technology has revolutionized the way schools identify struggling students and manage the advising process — but the hard part is what happens after a student is flagged “at risk.” Two institutions share how they have fine-tuned their intervention strategies.

**IT USED TO BE** that Ramapo College of New Jersey instructors would be asked by myriad departments — athletics, specialized services and various financial aid offices — to fill out questionnaires giving feedback about the students in their classes. The goal was to find out how students were doing and whether they needed extra help. These surveys came in a multitude of formats and might, in some cases, ask about the same student who belonged to multiple programs. At best, said Chris Romano, vice president of enrollment management and student affairs, the response rate would be about 40 percent. The faculty feedback that did come in would really only go to whichever entity had done the requesting, and the faculty themselves would rarely hear back about what actions had been taken. The results would go into a black hole, never to be seen again.

Then in 2010, the 6,000-student college adopted Hobsons’ Starfish Early Alert and Starfish Connect. The first is an alerting application and the second is a case management tool.

Now the school takes a more “holistic view of the student,” noted Romano, where faculty or others can submit input and concerns about students within a screen or two, and in response, students can be connected to what the school calls a “success network” — a group of faculty, advisers and peer facilitators who provide academic guidance and help students navigate college life.

Muskegon Community College in Michigan follows a more straightforward approach for figuring out which students are at risk of failing classes or dropping out: The moment they enter college, they’re considered at risk, explained John Selmon, vice president for student services and administration. His institution wants to make it “inescapable” that every single one of its 4,800 students gets the help he or she needs to succeed. Help can come in many forms: academic goal setting and planning, new student orientation, access to a college success course, developmental education, tutoring and supplemental instruction — all of which are high-impact educational practices recommended by the Center for Community College Student Engagement. Currently, the college has adopted seven of the 13 CCCSE practices; but in time it will put the remaining six in place as well.

Last year, Muskegon adopted Ellucian CRM Advise, an application that provides an overall view of students, their risk levels and information about the intervention strate-
gies that have been applied to mitigate the risks.

At both institutions, putting a retention system in place has been the first step toward boosting student success, but the real work begins after a student has been flagged as "at risk." Here’s how the two colleges currently meet the challenge.

**Simplify the Response Process**

At Ramapo, when a student hasn’t paid a tuition bill on time or submitted financial aid paperwork by the deadline, Starfish Early Alert flags the lack of activity and notifies the student’s “success network.” A similar notification occurs when faculty members send up the alarm that assignments aren’t being turned in or a student isn’t showing up to class. The success network figures out who should get in touch with the student, and contact is made with specific directions. Though the directions vary, ultimately students head to a portal that lists the contact details for every instructor and office with which they have a connection, where they can engage in simple, fast communications — whether by sending an e-mail, making a call or setting up an appointment.

“Students don’t view us by what division or what VP we report to,” said Romano. “They see us all as one college or one university. So we want to make sure we are providing them the opportunity, through technology, to interact with us as one place and not have them bouncing around.”

Muskegon views its response effort as “working from the classroom out.” As Selmon explained, “Students spend more time with our faculty than any other particular personnel here on campus.” So when an instructor recognizes that a student probably needs tutoring, “they click a button, and the tutoring center gets that information. The tutoring center follows up on that person and gets them into tutoring.”

**Measuring the Impact**

The overall results of Starfish use at Ramapo College of New Jersey — still in a work progress — have been impressive. In 2008, for example, the four-year graduation rate was 58.1 percent. Now it’s at about 61 percent. With a freshman class of about 900 students, every 1 percent equates to about nine students. “So we’re talking about graduating about 27 to 30 more students a year in four years, which is significant,” said Chris Romano, vice president of enrollment management and student affairs.

Muskegon Community College (MI), which is about a year into the use of Ellucian CRM Advise, isn’t sharing numbers yet. However, this much is true: “The more practices that we get students into, the better their GPAs, persistence rates and retention rates,” said John Selmon, vice president for student services and administration. “We’re starting to see the difference right now, and we know if we stay the course the next three or four years, our numbers are going to be significantly better than they are today. And at the end of the day, students win.”

**Employ an Advisory Team**

At both institutions, an advisory team helps monitor and continually improve retention processes. Muskegon’s “academic care team” includes faculty, advisers, administrators and students. The Ramapo advisory board, which meets monthly, is chaired by the college’s student success spe-
Retention

‘We’re trying to be more strategic about what we’re asking faculty to tell us.”

Focus on Closing the Gap

At Muskegon, when a faculty member has relayed a concern about a student, that “signal” is fed automatically to the care team, a group of people who do an assessment and decide what “point person” in the student’s life should handle outreach. Once contact has been made, the point person adds a note to the system about what’s coming up next — whether an appointment or some other action the student will take.

Both Muskegon and Ramapo have similar phrases they use to describe the full cycle of response for at-risk students. Muskegon calls it “closing the gap”; Ramapo refers to it as “closing the loop.” But the point in either event is that the person who sends up the signal for help has a way of tracking the response. No longer is the finish disconnected from the starting line. Faculty or others with access to the system can find out what happened.

For example, Ramapo’s athletic department reports to Romano. This traditionally high-risk population continually struggles to balance academics and athletics, he noted. So in the latest school year, he and his team set a goal of closing the loop related to athletics 100 percent of the time. If a faculty member raises a flag about an athlete, that alert goes to the coach and the athletic adviser, who have developed processes for the coach to respond about what is being done to support the student — whether extra tutoring, better class attendance or something else.

The athletic adviser is the gatekeeper to close those flags and report on what the coach is doing to make sure the athletes remain compliant with NCCA regulations, that they perform in class and that they are doing what they came to the college to do — “which is be successful academically,” explained Romano. Even in the first year it has been applied, the student alert system has had a “transformative impact on the relationship between athletics and academics at Ramapo,” he said. And 100 percent of those open flags have been addressed.

While the results aren’t all due to the technology, “technology does play an important part in terms of creating efficiency,” observed Selmon. “If you can see on a screen where a person has a gap, and you can take that opportunity at that time to close that gap, it saves time and energy and everything else. It becomes very effective.”

Dian Schaffhauser is a senior contributing editor for Campus Technology.
The Ever-Changing CIO Job Description

Longtime chief information officers reflect on how their day-to-day activities have changed and what skills are most important for today’s IT leaders.

JACK SUESS has worked at the University of Maryland Baltimore County since 1981, and he led the IT organization for several years before being named vice president and CIO in 2000. In the early days, his role was much more narrowly focused. In the '90s, the job of IT director was more of a technician role, he said. “I was one of 50 people on campus who had the title of director — and that didn’t get you onto the president’s council or on the budget committee. I was reporting to the vice provost for academic affairs. While he may have participated in some of the committees, I didn’t. So you were getting your lens filtered.” But things have changed dramatically since then, he said. “The skills you needed to be an IT leader in the late '90s were completely different than what you need today.”

The chief information officer position continues to evolve as technology becomes more central to the mission of the university. How has that affected what the CIO does day to day? Campus Technology asked several longtime IT leaders, including Suess, to reflect on how they have seen the job change during their tenures.

When UMBC created the CIO position in 2000, the institution was saying it wanted IT in the room when the administration started to think about strategy, Suess said. “At that point I got to be involved in budget committees, attending the president’s council, and got to be part of the strategic planning committee.” That move from director to CIO was about beginning to position IT as a department of strategic importance. Fast forward to 2005, he added, and to be a vice president at UMBC was to be a thought leader who understands higher education and the broad-based issues impacting the university. “My special role is to make sure we are applying technology strategically to be advancing the core priorities of the university.”

Suess started his career working on Unix systems and then doing web programming. “But I don’t do any of those things today,” he said. He spends his time building relationships internal to the campus, thinking about strategy or working with groups external to campus, such as Educause and Internet2. “I probably spend a day and a half per week on outside activities,” he estimated. The
Contract Oversight, Security Responsibilities on the Rise
Theresa Rowe is CIO at Oakland University (MI), a position she has held since 2002. She has been at Oakland University since 1990, serving as a senior systems analyst, the manager of student information systems and director of information systems before stepping into her current role. One of the biggest changes she has noticed is that Oakland is buying or contracting for a lot more software solutions than it did 15 years ago. “The contracts and licenses are much more complex than they used to be,” she said. “The volume and complexity has necessitated that we reorganize to create a procurement management position. This means as a CIO, I’m not overseeing a stagnant organization. I am constantly reviewing trends, unmet project expectations and organizational capacity, and I’m trying to reorganize and structure the organization to best support the campus community and provide a robust and dependable technical environment.”

Another shift Rowe has noticed over the years is that the oversight of security has become a greater challenge, because there is more data to be secured, more regulations, more threats and more vulnerabilities. Ubiquitous networking, particularly for pervasive wireless, has changed the network environment, she explained. People now expect network connectivity wherever they are. “This is a big shift in how we approach networking, and it has redefined network security,” Rowe said. That translates into more time spent on policies and procedures.

That increased focus on security is something Wayne Brown has picked up on as well. The vice president and
CIO at **Excelsior College** (NY) and founder of the Center for Higher Education Chief Information Officer Studies (CHECS), Brown has surveyed CIOs about their job attributes, education, experience and effectiveness for more than a decade. He observed that there are a lot of smaller institutions that don’t have much budget or staff dedicated to information security. “I have never been a chief information security officer, but I have been a CIO since the mid-’90s, and there is no way you can do both jobs. Something has to suffer. I would agree with [Rowe] that in the last 10 years [security] has gone to the top of the list of concerns.”

**An Emphasis on the Business of Higher Ed**

Sharon Blanton has served as CIO of several colleges and universities of different sizes, including **Scottsdale Community College** (AZ), **Pima Community College District** (AZ), **Portland State University** (OR) and **Hawaii Pacific University**. Last year, she took a position as vice president and CIO at **The College of New Jersey**.

She said that the CIO job description at each of those schools was fairly similar, although the job description at The College of New Jersey differed in two areas. “There was a very strong emphasis on governance and working collaboratively as a member of the cabinet. Now that I have been here for six months, I can really appreciate why so much emphasis was placed there,” she said. “They were really looking for a business partner who would fit into what was already a very strong, highly functioning cabinet. I don’t think this would have been a good fit for a first-time CIO. They really needed someone who could hit the ground running.”

Reflecting on all the CIO positions she has held, Blanton said the biggest change she has noticed over the years is that besides being a technical expert, the CIO is now expected to have a very high degree of business acumen. “We need to understand the business of higher education, but we also have to drill down and understand the business operations and workflow of many organizations throughout the campus.”

**Solving Problems From Across the Globe**

Joy Hatch, who became vice president for technology and CIO at **Fort Hays State University** (KS) in 2015, has been a CIO at several colleges and universities, including a six-year tenure as vice chancellor for information technology for the **Virginia Community College System**. She said she was attracted to Fort Hays State’s pioneering spirit: The institution has almost 14,000 students from around the world, a robust online program and global partnerships in various countries.

The expectations for a CIO have grown considerably over the years, Hatch noted. “My first CIO experience was simple: provide the technology and people will use it. The CIO was responsible for making sure the technology was up-to-date and perhaps providing a strategy for the academic technology. The technology at the time involved laptops and pagers with some folks using mobile phones, so expectations were lower,” she said.

Although CIOs still need to keep technology up-to-date, users’ expectations are changing, Hatch said. Students expect fast internet and mobile access. Employees now have e-mail on their phones, so trying to separate work and personal time has become more difficult. “And no matter where you are in the world, you are expected to solve problems, maintain secure data, manage digitalization projects and ensure all expectations are met,” she said.

That point was brought home to her on a recent three-week trip to China and Cambodia. “I negotiated technical support, explained upcoming changes to faculty, had discussions with staff and participated in meetings happening in Kansas,” she said. “Ten years ago the technology was not available to make this happen, and today it has become another tool in the toolbox to get business done.”

**Refocusing on the University Mission**

Jim Bottum is getting ready to step down as CIO at
Clemson University (SC) this month, after an illustrious career both there and as CIO at Purdue University (IN). Before being hired as CIO at Purdue in 2001, he had worked on supercomputing applications at the University of Illinois. He did not seek a CIO position, but Purdue approached him because it wanted someone to help the university move toward more IT centralization while keeping enough customization at the departmental level to support productivity. He also led a successful ERP implementation there at a time when there were lots of high-profile ERP implementation failures. After five years at Purdue, Bottum was looking for new opportunities and was approached by Clemson.

“They wanted high-performance computing, but when I got here they were not ready for it. It took us a year-and-a-half to set up a data center and get people in place who knew something about high-performance computing,” he recalled. “So there were a lot of infrastructure things to be done. But we went from no high-performance computing to being a national player working on NSF grants with top-tier universities.”

He said his work as CIO has shifted to spending more time communicating with faculty to ensure they are taking advantage of research computing capabilities. “At Clemson, six or seven years ago we had 19 of 54 academic departments using high-end computing. Today we have 48 of 54,” he said. “That was all because we brought the pendulum back from administrative computing to the research computing side. If you look at CIO budgets, 10 or 15 years ago the bulk was on infrastructure or administrative computing. It shouldn’t look like that today and certainly not five years from now,” he said. “We should get back to supporting the mission of the university. You are not going to distinguish yourself academically because of that.”

The New CIO Job Description
CHECS’ Brown has studied CIO job descriptions, and noted that they tend to be written very technically — down to which network certifications prospective candidates should have. “One interesting thing I noticed was that the more the institution had a brand name, such as Ivy League or Big 10 schools, the sketchier the job description was and the less specific they were about what they wanted,” he said.

Campus Technology asked three of the CIOs we interviewed what attributes they would put in a job description for their replacement:

Bottum said any new CIO job description should include figuring out a coherent cloud strategy. “Don’t let it happen in bits and pieces, which is the way it is happening on a lot of campuses now,” he said. “It is not a simple business plan. It involves getting people who run the university to change the way they do business.”

A CIO should have a successful change and project management history, and the ability to build an organization that operates with agility and responsiveness, recognizing the fast-changing environment, according to Rowe. The person should also have the ability to represent the university at a variety of external organizations, which are key to understanding trends. “The individual needs the ability to monitor and react to trends appropriately,” she said, “and to see patterns, connect the dots, explain to others and build consensus in response.”

For any IT leader to be able to have the confidence of their campus, they have to be delivering excellent service, so there is an operational component that is absolutely essential, Suess said. CIOs need to have a strong team so they can spend their time doing relationship building. “If you can’t deliver quality, robust services, you have no political capital on campus to talk about your vision. If the network keeps crashing or is slow, why are people going to believe that we could do some visionary new activity?”

David Raths is a freelance writer based in Philadelphia.
ACCESS TO 3D printing is on the must-have lists of more engineering students these days when they're selecting a college or university. With that in mind, competitive institutions are looking for more ways to incorporate 3D printing technology into courses and career paths.

There are many exciting and innovative ways in which higher education is using 3D printing. It can make the choice of institution difficult for prospective students. Here are just a few ways universities are using 3D printing in cost-effective and clever ways to teach career skills in the classroom:

**Rochester Institute of Technology:** Mechanical, industrial and manufacturing engineering students at the Rochester Institute of Technology in western New York line up to take a popular course from Professor Denis Cornier. His course is dedicated to exploring what 3D printing offers and what's ahead for the exciting, relatively new technology.

Students put design skills and ingenuity into practice in Cornier’s hands-on course. One student team recently built a working, four-color ukulele. Jeet S. Mehta, a graduate student pursuing a master's of science in mechanical engineering, said the course has a definite real-world component. “We now have the exposure to advanced and innovative techniques that we could use in the future,” he says.
Rutgers University School of Engineering: At Rutgers in New Jersey, an engineering student and his professor recently created a way to print sophisticated, durable 3D Braille maps of a local training center for the visually impaired. According to an article on the web site 3Ders.org, senior mechanical engineering student Jason Kim and assistant professor in the Department of Mechanical and Aerospace Engineering Howon Lee created maps about the size of a computer tablet. They placed them in a binder for ease of use. Each tactile map represents a different floor of the training center, and includes a Braille guide, something paper maps lacked.

During the process, the student and professor met with people who rely on the center and learned a few practical realities. Paper Braille maps break down very quickly. Wooden maps are clunky and awkward. “It was a very fulfilling experience. I learned a lot,” says Jason Kim. “The most difficult part was trying to imagine what it would be like to be blind myself so I could better tackle the problem, and it opened my eyes to the whole visually impaired and blind community.” The pair’s next project is a 3D-printed tactile map of the Rutgers campus, and the city of New Brunswick, in which it’s located.

Berea College: At Berea College in Kentucky, a private liberal arts college for promising students from Appalachia with limited economic resources, the class uses 3D printing to grasp on-the-job concepts like rapid prototyping, working backward from a finished object.

Professor Brad Christensen’s goal is to teach students the entire engineering design process. Using an inexpensive 3D printer purchased with grant money, a recent class designed and built boat propellers. Once they were complete, they tested them on a nearby ice-crusted lake (where they performed quite well). The real-world implications are clear from the start, says Christensen. “When students print a part, they are instantly confronted with [any] lack of attention to detail early in the process. They learn that one-sixteenth of an inch really matters. The 3D printer adds a new level to what we teach. It is a new avenue for learning. The students are actually seeing if something works or it doesn’t.”
BEYOND THE CLASSROOM: EXPANDING THE REACH OF 3D PRINTERS

UNIVERSITIES AND EDUCATIONAL EXPERTS SEE 3D PRINTING AS A KEY COMPONENT FOR PRACTICAL EDUCATION.

AS PART OF a decade-long shift toward emphasizing more hands-on learning in higher education, 3D printing is looming large. Indeed, it has been repeatedly identified by institutions such as EDUCAUSE as an important development in educational technology.

EDUCAUSE predicted a rapid escalation in 3D printers on campus, commenting in 2014 on a project at the University of Nevada, Reno. “Higher education’s need for 3D printing services could be both substantial and broad-based across disciplines.”

Industry is getting behind the idea as well. The New Media Consortium, a group of hardware manufacturers, software developers and publishers working to get multimedia-focused products into higher education, has also repeatedly extolled the idea of widespread adoption of 3D printing in higher education. With the EDUCAUSE Learning Initiative and other groups forecasting just a few years until widespread adoption of 3D printing, competitive higher education institutions need to move quickly to develop plans to offer the sort of 3D printing services that students may soon come to expect.

For colleges and universities, embracing 3D printing often comes down to working out cost-effective plans to provide the technology to an increasingly wide range of students.

As 3D printing becomes more popular and widespread, the types of disciplines that can make use of it go far beyond traditional engineering students. In order to reach more stu-
dents from different educational disciplines with a single printer investment, libraries can be excellent locations.

As Patrick Colegrove, head of the DeLaMare Science and Engineering Library at the University of Nevada, Reno (UNR), points out in an EDUCAUSE article describing his 3D printing project, “Libraries have always provisioned community access to rare and sometimes expensive technology for the common good.”

Colegrove’s project at UNR stands as an excellent example of what is possible. In early 2012, the university library began offering 3D printing and scanning support as a library service available to all its students, faculty and staff, as well as members of the public. It was one of the first academic libraries in the U.S. to do so.

Colegrove describes users from numerous different disciplines and organizations across campus quickly adopted the service. The university’s new 3D printers operated at or near capacity throughout the first year. For institutions looking for a way to build opportunities for hands-on learning, and link that education to practical training for real-world careers, 3D printing seems to offer boundless possibilities.

To introduce 3D printing relatively quickly, there are plenty of course materials and files already developed and available. Stratasys, a well-known name in 3D printing, offers a free semester-long curriculum for institutions interested in offering a course on 3D printing. The course lays out 14 weeks of lecture and lab time, four to six hours a week. It focuses on how to make something that moves something else, and delving into the various aspects of manufacturing and design.

Stratasys also provides stand-alone modules designed for the K12 market, although some colleges and universities have used them as well. The modular design means they’re more project-based and fit into a finite amount of time or an existing curriculum, such as a manufacturing or engineering class.

Wentworth Institute of Technology in Boston offers the full Stratasys curriculum as an interdisciplinary course teaching 3D printing skills to a range of students, from engineering and architectural design to construction management and beyond. “3D printing is important to today’s students because they’re tomorrow’s employees,” says Stephen Chomyszak, the assistant professor who teaches the course. “3D printing is going to be a vital skill in the workforce, now and into the future.”

3D Printing in Your Classroom
To help educators realize the benefits of using 3D printing in myriad academic settings, Stratasys has made available a free semester-long curriculum. It specifies a 14 week course that includes both lecture and lab time. To learn more about the Stratasys 3D printing curriculum, check it out at:

http://www.stratasys.com/industries/education/educators/curriculum#sthash.dMNd1A3i.dpuf
3D PRINTERS MOVE BEYOND ENGINEERING SCHOOLS

IN THE LAST THREE TO FIVE YEARS, MORE SCHOOLS ARE USING 3D PRINTERS TO TEACH A VARIETY OF HANDS-ON SKILLS.

FACED WITH THE challenge of engaging students through hands-on, project-based learning, colleges and universities are looking at new and different ways to apply 3D printing technology. 3D printers are becoming a fixture in engineering schools because they provide an effective hands-on route to understanding manufacturing and design. Now educators are also using them in libraries, bookstores, design centers, and other less-obvious locations.

“Students who graduate from high school have now had access to 3D printing for three, four, even five years; sometimes since middle school,” says Jesse Roitenberg, the North American education manager for Stratasys, a worldwide leader in 3D printing in education and industry. “We’re now seeing a demand from business schools, design schools, and the medical world.”

The nature of 3D printing—which “prints” objects using a machine that gradually lays down layers of plastic or other materials—teaches engineering-related skills like problem-solving, design specifics, computer modeling, and the importance of careful planning and measurements.

“What you learn from a 3D printer is how to be a better problem-solver,” says Roitenberg. “It’s like learning a different language—designing for an additive process instead of a subtractive process. It’s allowing students to be immersed in the problem-solving world, the real world.”

Roitenberg says attrition rates go down when students are engaged in the kind of hands-on education that 3D
printing involves. They get to apply their knowledge and produce something real. For that reason, he says, a variety of institutions, including the University of Minnesota and the University of Illinois, are starting to use 3D printers for first-year students.

“We’re seeing courses where freshman are doing and making and developing, instead of just sitting in calculus classes and physics classes. And [institutions] are seeing massive changes, because the students are so engaged,” says Roitenberg.

Real World Learning
Another interesting trend in using 3D printing in higher education, says Roitenberg, is an increase in collaborative projects involving engineering, business, and design students. “We’re seeing more students work together in groups. You get different outlooks and skills intertwined into one project,” he says. This is perhaps a glimpse at what students will encounter after graduation. The team process might involve developing an idea, going through thoughtful processes to see if it’s feasible—whether there are competitors in the market already, for example—then determining how to design the object, and the manufacturing costs.

As anyone who has watched the popular TV show “Grey’s Anatomy” can attest 3D printers are also gaining huge popularity in the medical world. Medical students working with 3D-printed objects “can touch and feel and interact with 3D-printed parts that are [exactly based on] an MRI or a CAT scan, or something out of a catalog,” says Roitenberg. “Medical students can really see it, touch it, hold it, and understand it.”

Educational activities are moving from simply academic to more real-world. “We used to talk to CEOs and heads of engineering about touching and feeling a product before they go to manufacturing,” he says. “Now we’re going to doctors and med students and saying, touch it and feel it, because you’re going to have to build a procedure around how to remove it.”

“The ability for students to engage and do really helps them remember what they’ve learned,” says Roitenberg. Universities have traditionally been about theory, but the success of 3D printers is expanding that approach. It pushes all sorts of courses and specialties toward more hands-on learning. In doing so, they are better preparing students for the very real, hands-on processes and projects they will encounter after graduation.

For more information go to www.stratasys.com
The University of Michigan GradeCraft team (left to right): Caitlin Holman, Barry Fishman, Adam Levick, Marie Hooper, Rachel Niemer, Ben Plummer, Jonathan Gabel and Jamie Wright

NOW IN THEIR 12TH YEAR, the Campus Technology Innovators awards recognize the innovative use of technology at colleges and universities around the globe. Each year we review nominations from the higher education community, considering each project’s scale, uniqueness and impact; what technologies were used and how; and what lessons might be learned from other institutions. For 2016, we honor 11 awardees in five categories: Teaching and Learning, IT Infrastructure and Systems; Student Systems and Services; Administration; and Education Futurists. Congratulations to all our Innovators!

Sincere thanks to our Innovators Judging Committee members (see “Our Judges,” page 34), who graciously volunteered their time and expertise to guide the final winner selection.

2016 Campus Technology Innovators Awards

We are pleased to introduce this year's honorees: 11 institutions using technology in innovative ways to improve teaching, learning, administration and operations in higher education. BY RHEA KELLY

Clemson University ................................................................. page 31
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TEACHING AND LEARNING

University of Michigan

Project: GradeCraft

Project lead: Barry Fishman, Arthur F. Thurnau Professor of Learning Technologies, School of Information and School of Education

Seeking to bring the qualities of well-designed games to pedagogical assessment, the University of Michigan created a “gameful” learning management system that uses elements such as competition, badges and unlocks to provide students with a personalized pathway through their courses. The technology has led instructors to clarify their learning goals, make deep changes in their assessment practices and rethink the purpose of grades and grading. Early research suggests that many students in gameful courses engage with content more deeply and intensely than they otherwise would.

“There are a number of technologies that automate what you do or make it easier. They help you do things better. This is a technology that enables you to do better things. But in order to do it, you have to be mindful about your teaching and do some redesign. We are using a learning community model where instructors get together monthly and discuss what we are doing.” — Barry Fishman, University of Michigan

Tech lineup:

- Developed in-house
- Alfa Jango
- Amazon Web Services

Virginia Commonwealth University

Project: The Great VCU Bike Race Book

Project lead: Gardner Campbell, special assistant to the provost and associate professor of English

When the 2015 Union Cycliste Internationale Road World Championships came to the VCU campus, the university embarked on a networked, multimedia, trans-disciplinary exploration of the event. Faculty created an array of new learning opportunities, including courses on films and cycling, cross-cultural issues, cycling safety, biking in Richmond, the physics of bicycling, the psychology of motivation, and more. In the process of learning by doing, students produced content that will be curated into a virtual “book.”

“The project was not just the experience of a sporting event. It represented something more, having to do with the
possibilities of human accomplishment and the commitment it takes to get to your goals. Our students saw around them, as they were pushing themselves in the context of their own intensive courses, world-class athletes who were committing their hearts and minds and bodies to excellence.” — Gardner Campbell, Virginia Commonwealth University

London School of Economics and Political Science

Project: Constitution UK

Project lead: Peter Bryant, head of learning technology and innovation

London School of Economics and Political Science (England) embarked on crowdsourced, gamified approach to education and citizenship, harnessing the massive open online space to engage a community of learners in writing a model UK constitution. The Constitution UK project aimed to integrate informal learning with discontinuous engagement, creating a highly flexible learning experience with no fixed points of entry. Participation progressively increased over the time the platform was open, reaching 1,500 participants — and generating thousands of online interactions, more than a million words of contributions and a final constitution of 8,000 words.

“What we were trying to do as much as possible was deliver a project that was opportunity-rich but demand-light. We didn’t want people to feel burdened by assignments and readings to do. We just wanted them to have an environment that was comfortable and where their opinions, thoughts and contributions were highly valued, and by mak-

The success of ConstitutionUK has led to an examination of how communities can crowdsource ideas and engage in debates around critical issues.
ing that the priority, we actually created a good space for learning to occur.” — Peter Bryant, London School of Economics and Political Science

**Tech lineup:**
- Crowdicity
- Facebook
- Storify
- Twitter

**University of South Florida**

**Project:** My Reviewers

**Project lead:** Joe Moxley, professor of English

My Reviewers is a set of document-markup, assessment, e-portfolio and publication tools that provides a structure for peer review of student writing and helps students understand academic conventions and writing processes. Plus, the software generates learning analytics that can be used to mentor instructors, conduct evidence-based curriculum enhancements, and assess program outcomes. Use of My Reviewers began in USF’s first-year composition program, and has since expanded to courses in professional and technical communication, chemistry, language, philosophy and history — as well as to partner universities around the world.

“Historically there has been a lot of research regarding the helpfulness of both teacher and student commenting. One thing that digital tools afford is a much simpler way to analyze that.” — Joe Moxley, University of South Florida

“The software [Moxley] developed is far more sophisticated in the types of metrics and in handling multiple reviews, instead of just a one-to-one setup you often find. It is a great pedagogical tool for helping writers understand audiences and for developing the interpersonal and cognitive skills of interacting with people about their work.”

— Val Ross, University of Pennsylvania

**Clemson University**

**Project:** Watt Family Innovation Center

**Project lead:** Charles Watt, founding partner

The architecture of the Watt Family Innovation Center is designed to support flexibility, transparency and collaboration.
Clemson University’s (SC) Watt Family Innovation Center is a state-of-the-art, tech-infused facility designed for flexibility, transparency and inter-disciplinary collaboration, devoted to creating an environment where collaboration between students, faculty and leaders from industry and government agencies generates ideas and solves complex problems. The building has become the natural home for Clemson’s Creative Inquiry program, which brings together approximately 500 students per semester from a variety of disciplines.

“This gives [students] a place to come together. Even the hallways here have collaborative spaces. I see it as the first full-scale building to address the discipline of technology and how it enhances interactive learning. It is a first-rate building and I see it as a model for higher education.”
— Charles Watt, founding partner

Tech lineup:

- Biamp Systems
- Brocade
- Christie Digital
- Cisco
- Crestron
- Da-Lite
- Dell
- Digital Projection
- Echo360
- Extreme Networks
- Harman
- Haworth
- Jupiter Systems
- Mersive
- Philips
- Planar
- Visix
- XPAND
University at Buffalo, State University of New York

Project: FLEXspace
Project lead: Lisa Stephens, senior strategist, SUNY Academic Innovation

The Flexible Learning Environments eXchange (FLEXspace) was launched in 2012 as a way for SUNY to more effectively share information about classroom building and renovation across its 64-campus system. Thanks to the support of a cross-institutional team of core contributors — including representatives from California State University, Foothill DeAnza and California Community Colleges, the Consortium of College and University Media Centers, InfoComm, the Society of College and University Planners, Educause Learning Initiative and ARTstor, as well as corporate sponsors Herman Miller and Crestron — that effort has expanded into a global, highly searchable, peer-reviewed repository of technology-enhanced learning spaces, freely available to the higher ed community.

“FLEXspace, particularly when coupled with the Learning Space Rating System, is envisioned to be not only an infrastructure or facilities planning tool, but ultimately a forum for learning space designers and builders, as well as faculty using these flexible learning spaces, to engage in global conversations about how space and environment impacts learning effectiveness.” — Lisa Stephens, University at Buffalo, SUNY

Tech lineup:
- ARTstor

STUDENT SYSTEMS AND SERVICES

University of San Diego

Project: Insight Mobile App
Project lead: Avi Badwal, senior director, enterprise technologies, information technology services

In an effort to help freshmen manage the college transition, the University of San Diego (CA) created a smart personal assistant app that helps students prioritize and track their tasks. The Insight mobile app leverages data from the university’s student information system to combine course information with color-coded workload views, nudges, task alerts and time tracking. The more students use Insight, the more efficient and personalized their mobile experience becomes, and the more the app can guide their decision-making. End-of-semester analytics allow students to see where their time
was spent throughout the semester, and how that has impacted their grades and academic performance overall.

“It’s the transition from the home and high school environment to a university campus that concerns us most — in particular, that 18-year-old who suddenly is responsible for managing their time and tasks in a university environment. We want to help them do that in a way that they can be successful. Generic personal assistants aren’t very effective for our students, because they are not tied in with our Student Information System or our Constituent Relationship Management System. To do something more powerful, we connect Insight with those two systems.” — Chris Wessells, University of San Diego

Insight helps University of San Diego students track their assignments and manage time spent on task.

OUR JUDGES

CT Innovators entries were reviewed by our Innovators Judging Committee, a group of higher ed tech leaders, many of whom are former Innovators awardees themselves. Judges did not review entries from their own institutions. Final winners were chosen by our team of editors.

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<th>Position/Institution</th>
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<td>Director, Weigle Information Commons, University of Pennsylvania Libraries</td>
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University of Central Florida

*Project:* Universal Design Online Content Inspection Tool
*Project lead:* Jacob Bates, Techrangers lead, Center for Distributed Learning

The University of Central Florida built an open source LTI tool that helps faculty discover and repair accessibility issues in their online courses. The Universal Design Online Content Inspection Tool, or UDOIT (pronounced “you do it”), scans course content within the institution’s Canvas learning management system and categorizes possible accessibility issues as “errors” or “suggestions.” A “UFIXIT” feature allows instructors to correct some accessibility issues from within UDOIT, reducing the workload for disability services personnel and decreasing the lead time for accessibility accommodations.

“UCF is taking the role as the visionary for UDOIT. But an open source project needs people and other institutions to contribute to it. We hope in the future that our community will be strong enough that we can get a consensus where they want to go with UDOIT.” — Jacob Bates, University of Central Florida

**Tech lineup:**
- Instructure

University of Maryland University College

*Project:* Office of Analytics/HelioCampus
*Project lead:* Darren Catalano, CEO of HelioCampus and former VP of analytics at University of Maryland University College

UMUC centralized data-driven decision-making on campus in a new Office of Analytics and developed a flexible data analytics solution that has helped reduce recruiting expenses, increase course completion and student persistence rates, and inform university policy. The resulting technology proved so valuable to administrators that the university spun it off into a startup company called HelioCampus, which provides both a business intelligence platform and data analysis services.

“We aimed to build a flexible platform that could answer many of the business questions that the university had. We needed to get information to the state and federal government and the university system of Maryland. We wanted to build a system where we could easily and in a timely manner answer the questions that the administration, faculty and other stakeholders had.” — Darren Catalano, HelioCampus

**Tech lineup:**
- Amazon Web Services
- HelioCampus
- Tableau
Marshall University

Project: Clio, a Mobile GPS-Enabled History Application

Project lead: David Trowbridge, associate professor of history

Marshall University (WV) history students have the opportunity to contribute to the digital commons through Clio, a free educational website and mobile application that guides users to thousands of historical and cultural sites throughout the United States. The content in Clio is curated by the crowd — anyone can create an entry (students as well as the general public) and highlight an historic site with geolinked images, video and text. To ensure accuracy, entries are vetted by faculty members or historical societies.

Clio picks up a user’s location and shows nearby landmarks; users can also perform their own searches by location or name. Each entry offers turn-by-turn directions as well as links to relevant books, articles, videos, primary sources and credible websites.

“I teach a number of history classes where students conduct original research. I wanted to do something besides have a file cabinet full of their research in my office. This is a way to share original research that I knew people in the community would care about.” — David Trowbridge, Marshall University

Tech lineup:
Strictly Business

University of Oklahoma

Project: OU Libraries NavApp

Project lead: Matt Cook, emerging technologies librarian

University of Oklahoma Libraries created a mobile app designed to put an end to the intimidation factor that visitors and new students feel when visiting the library for the first time. OU Libraries NavApp combines indoor Bluetooth beacons and outdoor GPS to guide users through large indoor environments while providing a plethora of location-based info and relevant push notifications about events, exhibit details, tutorials and more. The app not only enriches the visit experience, it also helps administrators track use.
age of exhibits, service desks, digital resources, study rooms and more.

“What we hope to accomplish first and foremost is the unification of the digital and physical campus: We can overlay digital resources on top of a physical location. So, instead of forcing the user to navigate a large or complex website, they simply get the content that they are looking for because they are standing at a certain location.” — Matt Cook, University of Oklahoma

**Tech lineup:**
- **Aruba**
- **Meridian**
- **RFIP CT**

*Reporting by Meg Lloyd and David Raths.*

**STAY TUNED**

In the coming months, *Campus Technology* will feature in-depth profiles of each Innovator, with project details, lessons learned, next steps and more. For more information, visit the CT Innovators awards website.

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Oct. 2–7
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Oct. 25–28
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Nov. 2–6
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