What Counts as Learning While Making?

As the maker movement makes strides in education, it’s important to identify its learning benefits — and find more robust ways to define and document success.

AT SXSWEDU LAST MONTH in Austin, the maker movement was in full force. The “making” theme permeated nearly every aspect of the conference, from the keynotes and sessions to hands-on exhibits — even a press event where education industry reporters constructed ducks out of Legos alongside Dan Rather. (Rather was at SXSWedu to present the inaugural Rather Prize, awarded to a student, teacher or administrator with the best idea to improve education in the state of Texas — and, no surprise, making and experiential learning factored into many of the finalists’ proposals.)

In the session “The Importance of Micro-Credentialing in Maker Education,” Jessica Parker, education community manager for Maker Ed, spoke about the relationship between making and learning. “We can learn a lot from the maker movement and maker educators by asking a simple question,” she said: “What counts as learning while making?”

Parker asked that very question to educators over a period of 18 months, and came up with three primary reasons that making is meaningful for students:

- **Making promotes social and emotional learning.** Learners gain an increased willingness to try new things, to struggle, to collaborate. They seek out resources from one another, and tend to be more self-directed.

- **The learning process itself.** Brainstorming, tinkering, exploring, iteration and building on ideas result in learning that is generative, not only for the students, but also for the facilitators and instructors in the room.

- **An increased opportunity for reflection.** With making, ongoing reflection is embedded throughout the process. The learners themselves gain insight into how they learn. Interestingly, Parker’s survey of maker educators also revealed that the instructors themselves have something to gain from the experience. Some of the benefits she cited:
  - **Understanding students on a deeper level.** When educators actually see the students making, they get to know them better and can promote their individual strengths.
  - **Sense of renewal.** Many educators told Parker that the act of making with their students helped them reconnect with the reasons they got into the teaching profession in the first place.
  - **Improving classroom practice.** The making experience inspires educators to change their own teaching methods: They are able to offer more hands-on opportunities; step back to allow students to explore; promote more active engagement with students; and create a more student-directed classroom.

Parker highlighted the need to document the learning that happens throughout the making process. “So often in our discussions around learning, we tend to overemphasize the outcome — that final product,” she noted. “We focus in on that degree, the diploma, the teaching credential. What becomes lost in this is really the opportunity to highlight the amazing learning that happens during the process itself of earning said degree or said diploma.”

One solution may lie in the growing popularity and sophistication of badges and micro-credentials, Parker pointed out. “If we move toward an economy of micro-credentialing that allows maker educators and young makers to broaden what success looks like, we can highlight different forms of success and the valuable gradations of learning that happen on a daily, weekly, monthly and annual basis, not only in our classrooms, but in our libraries and our museums, in our communities and also in our own households.”

Continue the conversation.
E-mail me at rkelly@1105media.com.
POD PEOPLE. Washington State University has begun testing out a “napping pod” as part of a transformation of its student recreation hub. The university’s new Chinook Student Center will feature a hot yoga studio, an espresso bar and as many as 10 or 15 “EnergyPods” from MetroNaps — self-contained units that give students privacy while they take timed power naps to ambient music. Read the full story online.

3D PRINTING FROM ANYWHERE. Penn State students and faculty all over the world can now design and 3D print their own materials at a new 3D printing lab known as the Maker Commons. The facility is located at the institution’s University Park campus, but individuals from all Penn State campuses — including the online Penn State World Campus — can upload and print projects at makercommons.psu.edu. Completed projects are delivered via the same system used for intercampus library materials requests. Read the full story online.

DIGITAL DISAGREEMENT. A recent survey found that while 45 percent of students consider themselves “highly digitally literate,” only 14 percent of faculty would agree. Conversely, 49 percent of surveyed faculty said they’re quite digitally literate, but only 23 percent of their students agreed. Read the full story online.

CERTIFIED LEARNER SUPPORT. Ball State University (IN) has become the first higher education institution in the country to earn Quality Matters’ Learner Support Program Certification for an online program. One of four QM online program certifications, the Learning Support Program category “recognizes programs that provide all the critical student and academic services needed for learner success and use learner feedback to continuously improve those services.” Ball State piloted the new certification in spring 2015. Read the full story online.

MAKER APP. Students at the Massachusetts Institute of Technology now have a new mobile app, Mobius, designed to help them navigate the various maker resources on campus. The app aims to match users with available spaces while assisting technical staff with shop management and improving student communication and interaction. Read the full story online.

MOVING IN TOGETHER. The state of Hawaii is moving some of its information technology systems from its Kalanimoku primary data center to a facility at the University of Hawaii. The institution’s UH IT Center is a 74,000-square-foot LEED Gold data center that houses the enterprise information and communications technology systems for the university’s 10 campuses throughout the state. State officials expect the move will save millions of dollars in duplicative spending. Read the full story online.

LEARNING REVAMP. Australia’s University of Adelaide is redesigning its teaching and learning model, using technology from Echo360 to promote active learning in the classroom. The institution will roll out the Echo360 platform to “help instructors make the most of class time, giving students more discovery-based,
small group interaction with peers and lecturers,” according to a press release. See the full story online.

**DATA DEGREE.** The University of Illinois at Urbana-Champaign is offering an online Master of Computer Science in Data Science degree through the Coursera MOOC platform. The degree is designed to build expertise in data visualization, machine learning, data mining and cloud computing to prepare students for careers as data scientists. Full tuition for the program costs $19,200 for 32 credit hours, and students can complete the program in as little as one year. For increased flexibility, the program is designed to be stackable, so students can opt to take individual courses, several courses for a Coursera Certificate, or the complete master’s degree program. See the full story online.

**PRODUCT ROUNDUP**

- **Explain Everything Collaborative Whiteboard** allows users on different iPads to work on the same project in real time. See the full story online.
- **The ultra-portable IN1118HD projector** from InFocus weighs just 3.5 pounds, yet offers 2,400 lumens of brightness and 1080p resolution. See the full story online.
- **Oculus has begun shipping its Rift virtual reality headset** — first to those who invested in its idea through Kickstarter, and then to people who pre-ordered the device. See the full story online.

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7 Tips for Better Digital Signage Content

What are you doing to reach your campus community in today’s digital age? These key considerations will help get your digital message across more effectively.

IT SEEMS LIKE a lifetime ago when students would turn to a corkboard at the end of a hallway in a dorm or common area for information about what was happening around campus. It was easy enough to post new content, information could be location-relevant, and students could simply tear off a phone number to follow up on something they read on the board.

Nowadays, digital signs are part of new construction building plans, and are steadily becoming the new corkboard medium. Instead of having to design content, print it and physically deliver it to each strategically placed corkboard around campus, we can now automate the process in “real time” with digital signage technology. Additionally, more and more software applications are being developed to accommodate touchscreens, and Web sites are being designed for content consumption. These design trends increase the potential for an enhanced user experience with regard to digital signage.

Based on our experience at the University of Michigan, planning and designing sign content has proven to be more important than any other aspect of digital signage. In order to effectively reach your campus community, here are some things you need to consider.

1) Encourage Marketing and IT to Collaborate on Content

Through networking events and conferences, I’ve seen many cases where digital signage support fell under the umbrella of “marketing and communications” and other cases where it fell under “IT services.” What we’ve learned at Michigan is that it takes participation from both groups to produce the most effective digital signs. My role has often served as a liaison between the two, facilitating the sign design process — which has consisted of meeting with a unit, asking a lot of questions, and then teaching them how to use the digital signage software to accomplish their goals.
2) Ask the Right Questions

It’s important to think about the specifics of a digital sign’s placement, purpose, and content design. For example, if a unit is designing a digital sign for the lobby of a dorm that primarily houses engineering students on north campus, then the digital sign should be in a location within the building that is easily accessible to residents and visitors. Pertinent questions would include:

- What type of sign do you have now?
- Is it static or interactive?
- In the case of displaying the events feed, do you want users to be able to interact with the sign to scroll through events?
- Should users be able to drill down on a specific event to obtain more information?
- Does the sign look touchable?
- What about adding a QR code to make the information portable?

While data feeds will help to keep information current, attention must be paid to all content on a digital sign, so that it is frequently changed and refreshed — conditioning users that they can rely on the information displayed to be current.

3) Know Your Audience

Studies have shown that there is only a brief opportunity — one to five seconds — to get your message across to a person who is “just passing by” a sign. If your message is captivating enough to catch their attention, there is a good chance they will become engaged, which will only happen if the shared information is relevant to the life, liberty, and the pursuit of better code: register to join us today!
people who are passing by. This is why timing and relevance are key. In the example of the digital sign in the lobby of the engineering dorm, are there specific events that would be of particular interest to engineering students? Are there events nearby that might be relevant based on topic? What about events in the building?

4) Make It Accessible
Digital signage should embrace accessibility. This includes font (size, type, color), images, text alignment and placement of any touchable elements. There are lots of best practices documented for digital signage, but it is important to design a sign that will be accessible and usable by just about anyone, regardless of physical challenges.

5) Incorporate Live Data
Data feeds provide a mechanism for delivering frequently changing, “real-time” content to digital signs. For example, the University of Michigan Office of Student Life manages an events calendar Web site called “Happening @ Michigan” that provides data for all campus events. In January of 2016 alone, the site had 477,300 hits, proving itself to be an extremely useful tool for the campus community. To help students find the events most relevant to their interests, the Happening @ Michigan site offers multiple ways for users to search and filter events using event type, group or location. It also accommodates RSS, iCal and JSON data feed formats. Those same functions can be used by digital signs to display location-specific event information, making the sign content more relevant, eye-catching and interactive. Of course, that requires digital signage software that can connect to a data source and provide the ability to format and display data from that source, a feature that comes with most digital signage software today.

6) Keep It Fresh
While data feeds will help to keep information current, attention must be paid to all content on a digital sign, so that it is frequently changed and refreshed — conditioning users that they can rely on the information displayed to be current.

7) Track Results
There are many ways to measure the effectiveness of your sign content. For example, the survey software Qualtrics recently implemented a touch-friendly survey capability. While it’s primarily designed for mobile devices and tablets, after testing we determined that surveys could also be facilitated through displays on an interactive touch-screen digital sign. A survey can be configured to display questions where users can touch the answer they want, and the software records the data and sends reports based on activity.

As new technology continues to emerge, the design and integration possibilities for digital signage are endless — and by making sure the aforementioned considerations are addressed, your message will no doubt effectively reach the campus community.

Amanda Grabowski, business systems analyst at the University of Michigan, supports the digital signage service on campus and has been providing technical and functional support to the campus community for 16 years.

Last month at Digital Signage Expo 2016, Grabowski presented a roundtable entitled “Digital Signage in a Digital Age: What Are You Doing to Reach Your Campus Community?” For more information, go to digitalsignageexpo.net.
Go Big or Go Small: The Future of AV Displays

Today, students are interacting with content on large touchscreen flat panels. Soon, they could be using immersive head-mounted displays.

THE WAY STUDENTS view and interact with information on digital displays has evolved quite a bit over the last few years — and it’s poised for even greater change in the months ahead.

Many schools and colleges have invested in interactive flat panels (IFPs) that students can use as stand-alone systems without needing an externally connected device. New features and improvements have kept the technology relevant in today’s classrooms. But in the future, audiovisual systems on campus easily could include head-mounted displays (HMDs) that immerse students in fully interactive 3D learning environments.

Interactive Flat Panels

Interactive flat panels are finding favor in schools nationwide, said Ken Colson, senior vice president of sales and marketing for Unified AV, a Southeast-based audiovisual systems integrator headquartered in Atlanta.

The resolution, brightness and longevity of IFPs have been key selling points, according to Colson. IFPs don’t require replacement lamps, and many models support an onboard computer using the open pluggable specification (OPS) slot, so they don’t have to be connected to an external device.

Android models. The lion’s share of interactive displays for education have been powered by software from companies such as Smart Technologies or Promethean, Colson said — but a growing number of IFPs are now taking advantage of the Android operating system. They operate like a giant Android tablet, turning on instantly and providing all the interactivity of a tablet computer.

For instance, BenQ announced two new Android-based IFPs during the Texas Computer Education Association (TCEA) conference in February. The 79-inch RP790 features 4K resolution and 10-point multitouch technology, while the 75-inch RP750 features HD resolution, 20-point multitouch technology and a bacteria-resistant coating to help reduce the spread of germs.

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4K resolution. Ultra-high-definition displays, also called 4K displays because they contain four times the number of pixels as standard high-definition (1080p) displays, are becoming increasingly common as well. While 4K video screens might be too expensive for many schools, their incredibly sharp clarity could help with certain specialized applications, such as for research where fine detail is needed.

“When you hit 84-inch panels, all of them are 4K, and a majority of 75-inch panels are now 4K as well,” Colson said. For example, all of Smart Technologies’ larger displays (65 inches and up) are offered at 4K resolution, he noted. “For 65-inch and 70-inch displays, we’re seeing that 1080p is adequate,” he added, “but some schools are looking ahead and are starting to buy 4K displays, because they know the source resolution will continue to expand.”

Videoconferencing. InFocus has added videoconferencing capabilities to its latest IFP, the Mondopad. The interactive display blends video calling, whiteboarding and more in one giant touchscreen PC for face-to-face collaboration, either among students in the room or from remote locations. The Mondopad is available in 57-inch, 70-inch and 80-inch versions.

Other uses. A growing trend among schools and colleges is to create “huddle spaces” for small group activities by adding a second or third display to a room, Colson said. Plus, tabletop-based interactive displays are starting to become more common, especially for elementary and special-education classrooms: “IFPs today are much more durable than they were in the past, and so some schools are taking IFPs and turning them horizontally,” he explained.

For years, futurists have been predicting the use of virtual reality headsets as an instructional tool. Now, that future is finally arriving.

Head-Mounted Displays
Students might be interacting with large flat panels today — but next year, they could be interacting with small head-mounted displays too.

For years, futurists have been predicting the use of virtual reality (VR) headsets as an instructional tool. Now, that future is finally arriving, as several manufacturers — including Google, Microsoft, Oculus and Samsung — have brought HMDs to market in the last few months.

Google Cardboard is a simple, affordable 3D viewer that turns an Android phone into a panoramic display. The Google for Education team has designed Expeditions: virtual field trips that take advantage of the technology to provide immersive, interactive experiences — such as exploring the bottom of the sea or the ruins at Machu Picchu — that bring lessons to life for students.

On March 30, Microsoft released a developer version of its HoloLens technology, which it calls the “first fully untethered, holographic computer,” enabling users to interact with high-definition 3D holograms. Microsoft has partnered with
Market growth. HMDs, which sold about 140,000 units in 2015, are expected to sell about 1.43 million units in 2016 and 6.31 million units in 2017, according to a forecast from research firm Gartner.

Brian Blau, the analyst who wrote the report, said he doesn’t know how many of these sales will be for education. But he sees many possible uses for the technology in schools and colleges — from occupational training to investigative learning.

“I’m a big believer in giving kids immersive technologies such as VR,” said Blau, research vice president for Gartner’s Personal Technologies: Innovation division. “It’s such a powerful platform, and it will bring the world to kids wherever they are. Because it’s immersive and 3D, their experiences have a real potential to be much more personal and meaningful.”

Education applications. The 2016 Horizon Report from the New Media Consortium (NMC) predicted that virtual reality technology will be adopted by at least 20 percent of colleges and universities worldwide in the next two to three years.

At Penn State, the report noted, engineering students tasked with virtually assembling an object completed the project more efficiently when using the Oculus Rift VR headset and a haptic glove, compared to students who used a mouse, keyboard and computer program. And at Case Western Reserve University (OH) and the Cleveland Clinic to develop anatomical 3D images that medical students can explore, manipulate and examine from every angle.

“We’ve been teaching human anatomy the same way for a hundred years,” said Case Western President Barbara Snyder in a video about the technology. “Students get a cadaver, then they look at medical illustrations — and it’s completely two-dimensional. But the human body isn’t.” The HoloLens technology will allow students to interact with 3D content in ways they couldn’t before.

The Oculus Rift, a $599 head-mounted VR display, is available for preordering. And Samsung has developed the Gear VR headset, which is based on Oculus technology but costs $99 and works with a Galaxy phone. Samsung’s Education division said it’s looking for schools and colleges to pilot the technology.

Boise State (ID), nursing students are using Oculus Rift headsets to learn proper procedures for inserting catheters. The virtual reality method is less expensive and requires less space than using traditional mannequins, the report said — and it provides better real-time feedback for students.

“The compelling aspect of virtual reality is its ability to transport learners into environments and situations that they otherwise may never have access to,” said Samantha Adams Becker, senior director of publications and communications for the NMC. “Being able to walk among dinosaurs in a fifth-grade history class, being able to simulate surgeries for medical students — the potential applications are as unlimited as one’s imagination.”

Dennis Pierce is a freelance writer with 17 years of experience covering education and technology.
The Who and What of Classroom AV Design

Understanding project stakeholders and processes is key to better management of AV installations on campus.

THERE ARE PLENTY of resources out there informing readers about what projector they should buy or how to create huddle spaces — but when I was a higher ed tech manager, I was always looking for advice on successful project management. Particularly when there are architects and contractors involved with large projects, managing the design and installation of classroom AV systems can be a struggle.

This is the first article in a monthly “AV Smarts” series focusing on the design and construction process surrounding higher education classroom audiovisual systems. I will cover the different types of AV installation projects, the roles of all the stakeholders involved with classroom AV design and install, and the various phases of construction projects and how they pertain to AV, and I’ll dive deeper into each phase to highlight the major deliverables. I make an attempt to adhere to established standards from InfoComm and the AIA (The American Institute of Architects), but over the years I’ve tailored my project management process to reflect real-life scenarios. If you’ve ever struggled with keeping a classroom AV system installation on schedule, getting the right design deliverables to the right stakeholders, or ultimately delivering the exact AV system that the project called for, then this series of articles will help you. (To keep up with the rest of the AV Smarts series, subscribe to CT’s 21st Century Campus newsletter.)

Project Stakeholders

Before we dive into the different types of AV construction projects, or the phases that make up those projects, we need to review all the possible stakeholders in a higher ed AV installation project. If a classroom AV installation project goes awry and there’s a big scramble at the end of the project to get it back on course, it’s probably because the correct individuals were not involved with the project in an early phase. Every institution and every construction project has a slightly different mix of project stakeholders, but this is a typical makeup of all the major players:

OWNER TEAM:

Client. In the case of higher education construction projects, the client is usually the department that’s initiating the project request. Typically, a point person from the department is in charge of coordinating the department’s administrative involvement (budget, scheduling, etc.) in...
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AV SMARTS

the project, but he or she isn’t necessarily one of the individuals that will be using the new AV systems.

End users. Faculty or staff members, and sometimes students, are included in this group of individuals who will be using the new AV systems after installation. This group rarely has any knowledge of (or interest in) any of the administrative aspects of the construction project.

AV support staff. This group of stakeholders is made up of the individuals who will ultimately be responsible for the daily operation, repair and maintenance of the installed classroom audiovisual systems. They may be employed by the specific department requesting the AV installation, a centralized campuswide technology support department, or a combination of both. These staff members are also typically responsible for defining campuswide AV design and equipment standards.

IT staff. Information technology employees are responsible for providing and maintaining the IT infrastructure required for classroom audiovisual systems, such as network data connections and telecom service. This group defines IT design and technology standards for the campus.

Facilities staff. These campus staff members are responsible for the structural and electrical work associated with the installation of audiovisual equipment. They typically handle the wall or ceiling mounting of projection screens, projector mounts, interactive whiteboards, speaker mounts and other AV equipment attached to the building structure. They are also responsible for the installation of power outlets, connection of power to electric screens, providing cable path and pulling low voltage cables for AV installations. Facilities staff may also handle HVAC requirements pertaining to AV equipment. The institution’s interior designer may also be a part of this department. Depending on the size of the construction project and campus standards, other contracted trades may handle many of these duties.

Construction planning staff. Many institutions have a construction planning department that acts as the project manager for the owner side of construction projects. Some institutions hire a construction project manager to represent them, if they don’t have anyone on staff with those skills. Other project managers come into play from the general contractor and AV integrator, but the client’s project manager takes precedence and acts as the communication bridge between the institution’s stakeholders and the contracted stakeholders. This individual is also responsible for the administrative aspects of the project, like establishing the project timeline and assembling the required bid documents for the contracted stakeholders.

Design Team:

Architect. An architect is typically hired by the institution to provide design and construction administration services for larger construction projects. He or she assembles the project’s design team, which can consist of electrical, structural and mechanical engineers, as well as consultants specializing in AV design, acoustics, lighting and networking. Depending on the type of construction project and the institution’s project manager’s level of responsibility, the architect has a degree of involvement in the management of the construction phase.

AV consultant. An independent consultant who specializes in the design and construction project management of installed audiovisual systems. An AV consultant can be subcontracted by an architect or hired directly by an institution. A truly independent AV consultant is vendor and manufacturer agnostic, making design decisions based solely on the client’s best interests and needs.

Contractors:

AV integrator. This is a contractor that specializes in the design, installation, configuration and repair of audiovisual systems. The AV integrator may be contracted directly by the institution, or a subcontractor under the general contractor. Typically, the AV integrator roles that have some sort of client contact are: sales representative, design engineer, project manager and installation technicians. I’ll talk more about each individual’s role in subsequent articles.
**Contracted trades.** A general contractor, electrical contractor and HVAC contractor are typically hired by institutions for larger construction projects, when the required work exceeds the capacity of the campus facilities department. They are responsible for providing the same structural, mechanical and electrical services as described in the “Facilities staff” section.

**Types of Construction Projects**
Before we dive deeper into each phase of a construction project and discuss how each stakeholder is involved in those phases, we first need to talk about the different types of construction projects. Factors like project timeline, budget, funding source and the client’s construction project management experience all come into play when looking at the different types of construction projects. There are always exceptions to the rule, but from the perspective of AV system installations, projects typically fall into these categories:

- **Design-bid-build.** Design-bid-build projects are typically larger projects that involve many of the different stakeholders that I discussed. Project budgets need to be large enough to pay for this involved process, and the project schedule needs to have enough time allotted to each step in the process. State schools often have to rely on this process with project budgets over a certain amount, because they have strict public-fund bid requirements. They can’t have the same individual designing the bid documents, then also bidding on that same project to sell and install the equipment. From an AV standpoint, these projects typically involve an AV consultant taking a lead role in the design and installation management of the AV systems. The AV consultant works with the owner and design teams to prepare the initial infrastructure and technical system design documents (CAD drawings), as well as the bid documents needed to hire the AV integrator (scope of work or construction specifications). The AV integrator is hired through a bidding process and the construction phase begins. With direction from the AV consultant, the AV integrator finalizes documents (shop drawings), coordinates with other related trades and procures equipment, and the final installation takes place. Wrapping up the entire process, the AV consultant and owner’s representatives are involved in the commissioning of the AV systems. Throughout the course of this series of articles, I’ll be using the design-bid-build process as my basis for discussion, since it’s typically the process that many find hard to manage.

- **Design-build.** Another popular process in higher ed AV installation projects is the design-build model. From the AV standpoint, this process involves an AV integrator handling the design aspects of the project, as well as selling and installing the AV systems. This process is typically seen with projects that don’t have very involved infrastructure or technical design requirements. Projects that have a very compressed timeline or value-engineered budgets also typically look to the design-build model. Some higher education institutions rely heavily on the design-build process because they have in-house AV support staffers who are comfortable creating their own design documents (CAD drawings, scope of work, etc.), augmenting the design services provided by the AV integrator. Projects that are funded with private money may not require a full bid, which is a good case for the design-build model.

- **Other models.** There are other project management models that come into play when looking at higher ed AV installation projects, but they’re typically used for smaller projects. These are usually “homegrown” projects that many refer to as “hang-and-bangs”: small classroom installs that may involve a mix of owner-furnished equipment, for which the installation of equipment is either handled by the owner’s tech and facilities staff or an AV integrator. Since these models can take many forms, and usually don’t have well developed project management processes, I won’t be focusing on them in this series. CT

Mike Tomei is an AV design and management consultant based out of Central New York, and the owner of Tomei AV Consulting.
4 Rules for Writing a Better RFP

Issuing a request for proposal that gets the kind of response you want and need from vendors starts with refining your RFP process altogether.

**LAWRENCE LEVY,** president of Enrollment Rx, which sells cloud-based customer relationship management (CRM) for higher ed, sees a lot of RFPs come through his company. Those that cause him grief are the ones that form “two ends of bad on the spectrum.” On one end of bad is the RFP with “1,500 questions in it and the same question is repeated 10 times,” he explained. In that scenario, he imagines, the procurement person went to all of the committees involved in the technology purchase and said, “Give us all the questions you would ever want to ask in an RFP.” But nobody has gone through and winnowed out the duplicates. “That’s ineffective,” he said. “It’s certainly not a good use of our time to respond to something like that.”

The “bad” on the other end of the spectrum is the RFP that’s dozens of pages long, but the actual requirements only take up half a page. Rarely in that situation is the institution asking the “right questions,” said Levy.

In both cases, the RFP appears to be the first step in an institution’s process of discovery. “They’ll issue an RFP that misses the mark,” Levy sighed. “They’re either copying and pasting other RFP templates they found that don’t exactly fit their requirements, or they’re putting out a phone book worth of questions — seeking a product that maybe doesn’t even exist on Planet Earth.” The result: bad decision-making.

Compare that to the process in place at Babson College (MA). Robyn Betts, senior IT leader and director for the Project Management Office (PMO), won’t even put together a request for proposal until the entire project team has been pulled together with all the key stakeholders — “whether they like it or not,” she said. The team approach is important, she emphasized, “because everyone holds the key to different pieces of information. And if we don’t know all of that when we’re putting out an RFP, we’re going to have major surprises at the end.”

Once the group is in the room together and the governance structure is in place, the team members develop a project charter. This is a “pretty basic document,” Betts said, “that outlines why you’re doing the project, what the problems are that you’re trying to solve, what the opportunities are that you’re trying to introduce and what the success criteria are.”

The charter, she added, is “invaluable for really understanding what ‘good’ looks like at the end of this thing.” That’s just the start of the work undertaken by the project team way before the Massachusetts institution finally issues an RFP.
As Betts succinctly explained, writing a better RFP is really about putting a process in place and understanding what you want out of it.

1) Do Your Homework
Even before the project team is formed for an IT product or service that meets a specific monetary threshold, an official request goes through the Babson PMO to have the proposed technology vetted by the “business owner and others around the college,” said Betts, specifically to make sure that it “makes good business sense and adds value to Babson.”

Just introducing that step alone was an improvement on what existed before: a motley collection of haphazard practices where a college director would create an RFP that might or might not provide much detail; or even worse, a school leader would meet somebody somewhere and simply sign a contract based on good feelings.

Under the more centralized process, the PMO assigns a project manager and, potentially, a business analyst to work with the college unit that needs the solution. That team develops a project charter.

Pre-RFP, the project team does discovery work that may include speaking with possible vendors ahead of time, conferring with Gartner and Educause, reading magazine articles and talking with colleagues at other schools to “really get a sense of the landscape.” As Betts pointed out, “Truth be told, we’re all reinventing the world, so there’s plenty of information out there.”

Once the project team and sponsors have signed off on the project charter, the RFP is crafted in two parts, said Betts. One is a “narrative” that includes a lot of the charter text: “Why are we doing this? What’s the goal? What’s the scope of what we’re looking for?” The second part is a requirements matrix.

2) Develop the Matrix
As the project team meets, it begins compiling a list of requirements for the technology acquisition that will be documented into a matrix — actually a spreadsheet with multiple tabs for grouping functional areas. A matrix could have somewhere in the ballpark of 200 requirements, said Betts. By dividing them among different functional areas and giving each area its own tab, however, “it’s not as daunting” as it sounds.

“It also allows vendors to provide information in a more structured way. Perhaps they have different subject-matter experts who can comment on these things, so they can farm it out if they want to,” Betts explained. “And for us it’s great because, honestly, the value in all of this is getting our own ducks in a row before we go talk to people, to really make sure we know what we’re asking for.”

The items on that roster are prioritized through discussion and divvied up in two groupings: “need to have” and “want to have.”

That matrix is provided with the RFP for vendor

**GETTING THE BEST BUY**
Babson College uses a preapproved template every time it does an RFP to reflect the look and feel of the Project Management Office, and then adds relevant information. “We don’t have to jump through too many approval hoops before we issue it,” said PMO Director Robyn Betts.

Consider postponing the RFP — or dumping it altogether. Sometimes a more effective approach may be speaking to vendors, getting demos, asking and answering questions, and requesting that vendors provide proposals in their “own format,” suggested Enrollment Rx President Lawrence Levy. Then, he said, if the school still needs to issue the RFP after all of that information is gathered, “use that experience to craft it.”

Go for more than just streamlining your RFP process. That’s settling for the “low-hanging fruit,” said Betts. “The higher-hanging fruit is making it more effective.” In other words, she said, that means front-loading the work. “It’s about communicating and getting the requirements in a thorough enough way to make the RFP effective and get the outcome that you want.”
response. In the past the vendors were expected to answer yes or no to each item. Now, said Betts, Babson has gone more “robust” in its asking. The institution wants to know if the feature is “out-of-the-box functionality, custom development or something that’s configurable.”

At the same time, the vendor is asked to explain where there are requirements in the matrix that include third-party tools or additional software or any additional expense. That way, the college will know what level of effort is involved to meet the requirements. “Yes” is a great answer. But if it means it costs more money or costs more time, that may be different than what we had agreed to,” Betts said.

3) Improve Processes
In the best of all possible worlds, buying a new technology provides an institution with the opportunity to rewire its business processes and integrate disparate systems for greater efficiency and impact. At Babson, parallel with the requirements gathering, the project team diagrams the relevant business processes and considers how those might be overhauled.

As Betts described, “How people do their business today is documented in graphical format and then how people would like to do their business tomorrow is documented as well, to show who’s doing what at any given time.” Going through that exercise “really helps to eliminate redundancies and make those light bulbs go off for entire teams about how things are getting done today. It’s a masterful process. It’s fun to watch.”

4) Look Beyond the Numbers
Babson uses a scorecard to assess each response. That covers “multiple factors” forming the backdrop of the rating for each RFP response: whether the vendor has met the requirement, the pricing, the financial background and stability, and the vendor’s experience “with customers like us.” While the result is a numeric score, the evaluation can also become “a little more subjective,” Betts said.

When it’s applicable, the college invites finalists in for demos and discussions, which also become part of the scorecard. “At that point we probably have enough information to start to make a decision,” Betts said. “We might narrow it down — call references and do some due diligence on the financial background of the company.” Due diligence is easier to perform with public companies than with private ones, “but we do our best,” she added.

Then the project team is ready to make its purchase decision.

While all of that may sound like an unbearably time-consuming process, Betts estimates that most IT acquisitions take between 90 and 100 days from end to end, including the time dedicated to doing the requirements gathering all the way through to a fully negotiated and executed contract. “Our philosophy here — and mine in particular — is that the more work we do up front, the better it is for the project,” she said. “The more prepared we are before a vendor comes in, the smoother a project is going to go.”

Dian Schaffhauser is a senior contributing editor for Campus Technology.
The Numbers are staggering, and more than a bit disturbing. According to the Privacy Rights Clearinghouse (PRC), more than 700 security breaches involving educational institutions (including K-12, higher ed, and trade schools) compromised more than 14 million records between 2005 and 2014. And those were just the breaches that were made public.

A “Just in Time” research report published by the EDU-CAUSE Center for Analysis and Research (ECAR) says the occurrence of data breaches is even higher than those reported. “The total number of records affected by all breaches in the PRC database is likely two or three times larger than the currently reported total,” the report states.

That’s not surprising. Reports of cyberattacks and data breaches at colleges and universities have become an all-too-frequent occurrence. No institution wants to be the next headline. Consider these recent cyberattacks at universities around the country:

- Rutgers University, Rutgers, NJ: Within a six-month period in 2015, Rutgers was hit with three separate distributed denial of service (DDoS) attacks. These attacks took down Internet service across the campus. The interruption forced some professors to cancel classes, interrupted e-mail, and prevented students from submitting assignments or taking finals.

- University of Virginia, Charlottesville, VA: In June 2015, the University of Virginia (UVA) was forced to shut down access to many of its IT systems in response to a cyberattack by “sophisticated attackers from China,” reported school officials. Six months later, the university confirmed an unrelated phishing e-mail scam. Unauthorized individuals gained access to the human resources systems and exposed the payroll records of approximately 1,400 employees.

- Bradley University, Peoria, IL: In March 2015, Bradley University notified employees and former employees an internal investigation had discovered malware on two university computers containing personally identifiable information. The school also confirmed it had received reports from some employees indicating fraudulent tax returns were filed using their information following the data breach.

The Cost of Cyberattacks

The cost of a cyberattack at a college or university can be staggering—as staggering as the number of incidents themselves. According to a 2015 study by the Ponemon Institute (a research center dedicated to privacy, data pro-
tection, and information security policy) the cost to respond to and remediate a data breach now averages $3.8 million. In the education sector, the average cost of a data breach per lost or stolen record is as high as $300. That's only slightly less than the average cost of a healthcare breach.

Such costs include not only hiring an outside computer forensics team to launch a comprehensive investigation of all of a school's computing and information services, but also the cost for notifying both current and former students and faculty about the breach; and offering free credit monitoring services.

For example, in 2014, after falling victim to a sophisticated cyberattack, the University of Maryland (UMD) incurred not only the cost of remediation, but also the cost of notifying more than 300,000 students, faculty, and staff by mail, e-mail, and robo-calls. The school offered five years of free credit monitoring to everyone who was potentially affected by the breach. The school also conducted a series of seminars about data security and protecting against identity theft.

As Dr. Larry Ponemon, founder of Ponemon Institute, says, "Cyberattacks are increasing both in frequency and the cost to resolve the security incidents. [That includes] higher costs in forensic and investigative activities, assessments and crisis team management." Those costs also include the intangible expense related to the negative publicity any data breach brings to a university, or any organization.

Besides the cost of remediation, a data breach can result in significant legal fees to settle claims. As EDUCAUSE notes, “Potential direct financial costs of a data breach include legal representation, fines (depending on the nature of the breach), and the expense of notifying affected individuals.”

For example, in 2012 the University of Hawai‘i settled a class-action data breach lawsuit in which plaintiffs, including students, faculty, staff, and alumni, claimed the university released private information. That information included the social security numbers, home addresses, and credit card information of more than 90,000 individuals.

While the university denied all claims saying it did nothing wrong, the university decided to settle the lawsuit and to provide certain benefits to class action members, including continuous credit monitoring service for two free years. It cost the university $550,000, plus attorneys’ fees and costs, to provide those benefits.

Data Privacy Regulations

Colleges and universities are held accountable for data security by several federal regulations and state statues. These typically require certain levels of data protection and notifying affected individuals when a data breach of personal information occurs.

Two of the most notable federal regulations include the Family Educational Rights and Privacy Act (FERPA), which protects the privacy of student education records, and the Health Insurance Portability and Accountability Act (HIPAA), which defines policies with regard to the privacy and security of individually identifiable health information.

While there are no monetary penalties for violating FERPA guidelines, such violations do pose a risk to federal aid. HIPAA violations, however, often come with both civil and criminal consequences.

For example, in May 2013, Idaho State University (ISU) agreed to pay $400,000 to the U.S. Department of Health Human Services (HHS) for HIPAA violations involving the breach of unsecured electronic protected health information of 17,500 individuals. This happened after firewall protection was disabled at servers maintained by ISU.
A subsequent investigation found ISU "did not adequately implement security measures sufficient to reduce the risks and vulnerabilities to a reasonable and appropriate level." The investigation also noted if ISU had procedures in place for routine review of their information system, the firewall breach would have been detected much sooner.

Stay on Top of Network Security
Given the exorbitant costs involved in a typical data breach, the question becomes what can higher education institutions do to help mitigate the risks. A 2016 report from the Higher Education Information Security Council (HEISC), which includes chief information security officers, IT directors and managers, and IT staff members, identified three top strategies for data protection and network security. They include:

1. Ensure members of the institutional community (students, faculty, and staff) receive information security education and training. Research shows the majority of security breaches (in all sectors, not just education) are the result of human error. By creating what Dell calls a "culture of security" among all education stakeholders, colleges and universities can take huge steps in preventing hackers from penetrating network defenses and compromising the environment. As noted in a Dell white paper entitled The Human Side of IT Security, "IT security technologies are only as effective as the people who use them (or don’t)."

2. Develop an effective information security strategy that responds to institutional organization and culture. It should also elevate information security concerns to institutional leadership. Having a clear strategy in place for dealing with security issues, according to HEISC, helps support the institutional mission and core values. "An information security strategy provides focus and direction for the institution," says Melissa Woo, CIO and Vice Provost for Information Services at the University of Oregon. "It provides the campus a means for prioritizing resources and investments in information security."

3. Plan for and implement next-generation security technology to respond to evolving threats. Today, next-generation firewalls (NGFWs) offer the best defense for protecting a district's network. NGFWs offer many advanced capabilities for catching threats and combining multiple functions, including deep-packet inspection and integrated intrusion detection, into a single device. One critical function NGFWs provide is Identity and Access Management, which goes beyond basic password management. This helps ensure the right people have the right access without interrupting productivity. "We want our identity management systems to be smart enough so that when someone attaches to the network, we know who they are and which of our services they should immediately have access to," says Laura Patterson, CIO and associate VP at the University of Michigan.

Defending against ever-changing and increasingly sophisticated cyberattacks has become a top priority among colleges and universities throughout the country. To help lessen the potential damage such attacks can cause—not only in terms of remediation cost, but also potential legal issues—many schools are turning to next-generation firewalls and other technology tools.

As the HEISC report concludes, "With increasing concerns about cloud security, the Internet of Things, and other emerging, more sophisticated threats—as well as the ongoing challenge of limited campus resources (both financial and human)—finding new tools and technologies to help identify and mitigate threats more efficiently will continue to be of utmost importance to security and IT professionals."
The growing use of cloud and mobile computing has created a need for deeper network security and higher performance.

The multiple devices that students and faculty bring to campus create numerous opportunities for 21st century learning environments. Yet these devices also create additional network security issues and concerns for a school’s IT professionals.

“The proliferation of mobility is one of many challenges facing schools of higher education in terms of network security,” says Ken Dang, senior product marketing manager, Dell Security. “While these mobile devices have clear educational advantages, they also make campus networks more vulnerable to cyberattacks. More devices mean more risk. More devices also mean more applications are downloaded. The more applications that are used, the more vulnerabilities will exist. Applications are not without bugs and security exposures where smart criminals can exploit.”

At the same time, there has been a significant increase in the volume of encrypted Web traffic. “Our threat intelligence suggests more modern threats or attacks are now embedded in HTTPS traffic to evade defense system,” says Dang.
“FROM A SCHOOL PERSPECTIVE, IT’S ALSO IMPORTANT TO LOOK AT PEOPLE AND PROCESS WHEN ADDRESSING SECURITY CONCERNS.”

— KEN DANG, SENIOR PRODUCT MARKETING MANAGER, DELL SECURITY

These methods of attacks pose greater risks because it is more complex and difficult to detect. After all, a security system cannot stop what it cannot see. And to compound the issues, scanning that traffic to detect threats causes network performance to slow-down drastically. Many institutions are still not properly equipped to address this danger.

It’s not unusual for a school district’s networks to deflect millions of malicious intrusion attempts and malware and phishing attacks each day, he says, and the situation is expected to get worse. A recent survey conducted by the Center for Digital Education (CDE) among 139 higher education IT professionals found 61 percent expected malware to be a principal threat in the coming year. Seventy percent said they expected spam and phishing to be principal threats in the year ahead.

However, that same survey found 86 percent of respondents felt they were adequately prepared to detect and thwart a cyber-attack, even though, “many of those institutions don’t abide by network security best practices,” according to the CDE Issue Brief.

People and Process
While having state-of-the-art technology is important, says Dang, schools also need to consider people and processes in their security activities. “Technology vendors always talk about all the bells and whistles they can put in place to protect the environment from threats and attacks,” he says, “but from a school perspective, it’s also important to look at people and process when addressing security concerns.”

Students, faculty and staff need to be educated about what they can do to prevent cyberattacks. They need to understand the threats that are out there and how they can personally help mitigate the risks. Then there is also the issue of processes, says Dang. Is there a plan in place if the school were to be breached? How are they going to react to a breach? Do they have budgets to address both the tangible and intangible costs of an attack? “These are questions that IT professionals need to have answered before an attack occurs,” says Dang.

To address these concerns, schools need a deeper level of security across wired and wireless networks. “Next-generation firewalls (NGFWs), such as Dell’s SonicWALL, provide that kind of security without compromising network performance,” he says. Dell SonicWALL is designed to provide high-performance SSL decryption, a tightly integrated protection system (IPS), and cloud-based malware prevention that secures networks from the latest threats.

“Too often, schools have traditional security defenses in place, but are unable to address some of the advanced threats,” says Dang. “With Dell’s SonicWALL next-generation firewalls and unified threat management firewall, schools and universities can get the performance they need and the security they require.”

For more information, visit: software.dell.com/govern-protect
Your Course Accessibility Checklist

Yes, it's possible to embed accessibility into the course creation process, without expending too much time or effort. Here are things to consider during each development phase.

“IF YOU ARE teaching an online course, the chances are you have a student with a disability,” according to Jason Khurdan, department administrator in the Office of Disability Services at Rutgers University (NJ). Regardless of whether a university considers accessibility a priority now, he said, “eventually they will because it is becoming an issue that is more apparent in society as a whole.”

Khurdan spoke about accessibility issues at a Rutgers-hosted online learning conference in New Brunswick, NJ, this past January. He started his presentation by giving a live demonstration of the struggles a student would have using an NVDA (NonVisual Desktop Access) screen reader on a typical syllabus he found online. “Attendees saw how difficult it was to work through this document. Images weren’t tagged. It was difficult to find the accessibility statement,” said Khurdan. He noted that one survey of online distance learning Web pages found that only 23 percent of pages were accessible.

Like other universities around the country, Rutgers has ramped up its efforts to make both online and traditional courses accessible. In an interview with Campus Technology, Khurdan described how faculty members can embed accessibility into their course creation process — without having to become experts or devote inordinate amounts of time to the effort. He breaks that process up into four distinct phases, each with a checklist of recommendations.

1) Research Phase

Meet with campus experts. Developing a course takes many groups of people and skill sets, pointed out Khurdan. He recommends that faculty members set up meetings with the following groups:

- **Office of Disability Services**: The staffers here can provide you with great insights into how to make items more accessible. And thanks to their firsthand experience working with students and other instructors, they can help troubleshoot problems you may encounter.
- **IT/LMS management**: The folks who manage your learning management system know it inside and out, and chances are the problems you encounter are not unique. Working with them will help you better design your course for all students.
- **Libraries**: Libraries are essentially warehouses of information, and librarians have spent countless hours sifting through and collecting those pearls of wisdom.
- **Classroom Support**: Support personnel can help you understand what audio options are available, as well as
WiFi. Students who use CART (communication access real-time translation) may rely on that connection to view the live stream on their laptops or mobile devices.

Consider academic standards. Khurdan said faculty members must ask themselves what the academic standards are for a course, because those will be used to determine whether an accessibility accommodation is considered reasonable. For example, the use of a calculator will clearly violate the standards of an Algebra I course where students are expected to memorize multiplication tables. This may not be true of a psychology course that requires students to apply appropriate statistical principles.

2) Development Phase

Put together a required reading list. For students who need their books in alternate-format text, it’s a good idea to publish your required reading lists as soon as possible. If you are posting things online, try to use accessible versions of text whenever possible.

Include an accessibility statement in your syllabus. An accessibility statement provides information on where students with disabilities should go if they need assistance. Encourage students to speak with you in private about any accessibility challenges they may be facing. Keep the conversation focused on challenges they may be having accessing information.

Are course documents accessible? Font type, color and size can all have an impact on a document’s accessibility.

ACCESSIBILITY AUDITING

At George Mason University (VA), an effort to streamline the development of new distance education courses has accentuated the importance of integrating accessibility into course design — and making sure accessibility can be audited across the whole university.

According to IT Accessibility Coordinator Kara Zirkle, new distance education courses at George Mason used to go through a yearlong “4P” process (proposal, production, pilot and portfolio) that included an accessibility section. But the lengthy process was holding back course development. “We just weren’t able to push out as many courses as we would have liked to from Distance Education’s perspective,” she said.

So instructional designers moved to a program called the Online Course Development Institute (OCDI), which shrinks the process down from a year to only six weeks. Faculty members focus on creating just one module rather than their whole course. Accessibility issues take up one of the six weeks. Faculty members have to take one of the documents they created and make it accessible, as well as add captions to their videos.

“We have a checklist we use as an audit document,” Zirkle explained. Items on the list include: Do you have the most up-to-date disability statement in the syllabus? Do you have the accessible document structures and tables? If you are providing links in the course, do you also provide a PDF version of that link? In addition, Zirkle said, “The OCDI process introduces faculty members to our office and its services. We provide free captioning and free document conversion.”

Once the course material goes through an audit, if the issues are minor, some faculty members address them themselves while others require more help or ask to learn how to make changes on a regular basis. “One of the biggest issues we saw in early reviews involved videos not being captioned,” Zirkle said. “Well, we offer that as a free service, so that is an easy fix.” Another common issue involves the supplemental applications offered by textbook companies, she added.

Since September 2015, George Mason has made the course audit process available to the whole university (not just distance education) through its Assistive Technology Initiative. Still, Zirkle said, distance education courses are usually the most difficult to figure out how to make accessible. “If you can figure out how to make that online course accessible, that trickles down to all other courses,” she said.
Use readable fonts such as Arial, Verdana and other sans serif fonts. Try to avoid ornate, cursive-type fonts that may be difficult for someone with a visual impairment to read.

Bigger is better. As we get older we all have trouble reading, so avoid using small font sizes.

Stick to black on white. Some individuals may have a disability that makes it difficult to see contrast. To check if your foreground and background colors are accessible, try passing them through a color contrast checker on the Web.

Avoid using color on its own to represent meaning or distinguish between items. When possible, combine color with shapes or use written content to distinguish between items. For example, a line chart may have two series listed on it: one with round markers along it, and another with diamond markers along it.

Style guides can help. The style guide function in Word is a simple way for faculty to incorporate accessibility into documents, suggested Khurdan. “Documents have structure. Start building structure into everything you do, so that people with visual impairment can follow along.”

3) Design Phase

Pay attention to navigation. Can a student with a disability navigate your course materials with the same ease that other students can? A variety of tactics can help improve accessibility:

- Use consistent navigation on all of your pages;
- Make navigation items easy to understand;
- Make sure that course materials can be navigated with a screen reader and with the use of the keyboard or other assistive technology;
- Avoid iframes, as screen readers have a difficult time processing them; and
- If you are a developer, use ARIA landmarks to clearly define navigation sections.

Ask the host of your LMS:

- Can students access and navigate my site easily with a screen reader? Have you tested it with a screen reader?
- For students who need to use CART services, is there a module available to plug captions into the course?

Include captions. If you use video, take steps to have the video captioned or provide a transcription of the video if applicable. If you are posting audio, include a transcription file along with it.

4) Implementation Phase

Communicate up front with students. On Day 1, as you go over the syllabus, let students know that if they have or believe they have a disability and need assistance, they should speak with their Disability Services office.

Remember exams. Work with your IT department and LMS management team to ensure that any exam is accessible with a screen reader. If a student presents you with a letter for extended time, you should also work with him or her to help you determine how to make those arrangements online. If faculty members approach the Office of Disability Services about these issues during the research phase, Khurdan noted, they can head off problems before they come up. “If you let us know the day of the exam, it doesn’t do us a whole lot of good.”

Accessibility Resource

The University of Washington has developed an online IT accessibility checklist along with extensive how-tos: washington.edu/accessibility/checklist.

As the site notes, many of the items in UW’s checklist apply to Web pages and Web-based applications; electronic documents in Microsoft Word, Adobe PDF and other formats; and other products and services that are not specifically Web-based.

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How to Go Textbook Free

The University of Maryland University College is the largest institution in the country to go “commando” on textbooks. As of this academic year undergraduates don’t have to lug them around or spend a dime on them — and the benefits don’t end there. Here’s how UMUC achieved an amazing goal.

IF YOU'RE WAITING for the day when open educational resources (OER) have truly arrived on campus in a big way, you’re late to class. As of fall 2015, the University of Maryland University College no longer expects any undergraduate to spend money on textbooks. By next fall, the same will be true for its graduate students. The conservative estimate of savings for the university's 84,000 students is somewhere north of $10 million per year. And more importantly, the university has reason to believe that student learning is improving under the new strategy.

Figuring out how to develop the curriculum for use in more than 700 individual courses wasn’t as simple as taking existing OER textbooks with Creative Commons licenses and “chopping” them into pieces, said Matt Prineas, vice provost and dean of the Undergraduate School. Because no model really existed for what the university was undertaking, it had to figure out its own process.

Course Outcomes and Objectives

Although the widespread shift to free curriculum officially started in 2013, the groundwork was laid three years earlier when the mostly online university revised its undergraduate programs to be “outcomes-based,” according to Prineas. In all of its courses, the school first identified program-level outcomes and then the objectives that mapped to those outcomes.

As Prineas explained, that “curricular transformation” encompassed not just the curriculum but also the length of the term, which shrank from 16 weeks to eight weeks. As a result faculty couldn’t think about this shift as taking a “certain body of content” and “jamming it into eight weeks.” They had to reconsider their courses in terms of the learning objectives for each. A natural outcome was a re-examination of the content, projects and assessments that would best allow them to teach the learning objectives.

What the university didn't realize at the time was that the work begun in 2010 "set us up perfectly for our task in 2013,” noted Prineas. “When you don’t have a textbook, what do you do? If you have defined learning objectives for every course, that gives you a framework for making choices about materials.”
The Work Team Approach

The faculty model at UMUC is to maintain a very small full-time faculty (“a little over a hundred,” Prineas said) and a sizable group of adjunct faculty (“several thousand”), people with both academic backgrounds and experience in the fields they’re teaching — “scholar practitioners” in UMUC parlance. While individual courses are sometimes taught by the full-timers, for the most part their responsibility is to “manage and design and do quality control” of the programs.

The curriculum transition exploited that model. To find and prepare digital content that would mesh with learning objectives for each course, UMUC typically used a team approach with four roles: instructional designer, librarian, a subject-matter expert (one of those scholar-practitioners) and a program chair or full-time faculty member who understood how the course fit into the program as a whole.

Prepping the Curriculum

The content development process would begin with a discovery phase, wherein librarians helped identify “a whole suite of possible materials” for each learning objective. “That was challenge at the beginning,” noted Prineas. “In some disciplines it’s a natural fit because there are so many resources out there and it’s dynamic. In others there was a sense of, where do you even begin?”

Then the subject-matter expert would work with the materials and make decisions about what was appropriate for the course. Inevitably, gaps would surface where the available OER didn’t fully address the learning objectives of a given course. When that happened, non-OER resources were considered.

“Our project was from the beginning about making the materials available at no cost to the students. That doesn’t mean no cost to us,” Prineas admitted. Sometimes the gap could be closed with the use of proprietary databases that the library subscribes to. In other cases repurposed material was used. “We were working with the online courses that we had already created, and so for all 31 of our undergraduate programs, they’re all available fully online. There was a lot of content there that could be repackaged for this OER effort,” he said.

Sometimes, the school created new materials. An example of that, Prineas offered, would be a survey history course covering the Civil War. “You can find all kinds of fantastic archival stuff — databases, really sophisticated kinds of resources on the Internet. But one of the things
that a textbook does is give context to those materials, especially at the lower levels. There was some of that writing and framing that our faculty needed to do.”

Sometimes, there was no choice but to license content, such as novels still under copyright for certain English classes. In other cases, such as with the university’s course “Model Digital Forensics Analysis and Application,” the students are given access to digital materials as well as industry-caliber software they use through virtual desktops.

Preparing for Student Consumption
Once the content was compiled for a given course, it was put through an approval process to address copyright permissions and accessibility issues. That could be “fairly complicated,” Prineas suggested. In the simplest scenario, the librarians would establish whether the material could be downloaded and used in the courses under Creative Commons licensing. Other times the determination would be “escalated” to the university’s legal department.

The last phase was to package the content so that it made sense for the “flow of learning” to be followed by students week after week. While textbooks do a great job of providing “just the right bite-sized pieces for individual lessons or units,” that doesn’t just happen when the resources are coming from multiple places, said Prineas.

Also, figuring out the appropriate form for the content was an evolving process. “It doesn’t help if you’ve found these wonderful materials but then all the student sees is a list of links.” Besides, he added, the use of a link list is problematic because it requires quite a bit of maintenance. Storing the complete materials in a database and linking to them from within the university learning management system proved to be more stable. That practice required less maintenance and students had an easier time downloading content.

Throughout the various stages, faculty who may or may not have been working on the teams would have an opportunity to weigh in on the resources for particular courses. That became a lesson learned for project planning, Prineas explained. “It took time to understand that it has to be an iterative process. Occasionally you get lucky and there’s an open textbook with a Creative Commons license, and you can slice it and dice it however you want for that course. But most of the time that’s not the case. You really have to build in time for that conversation, taking into account the need for that iterative, evolving nature of putting these bundles together.”

Those who were advocates and practitioners of the digital content approach became the early leaders and champions of the initiative, and that’s where UMUC started the conversion work. Then, as the multistaged approach became more refined, “we could tackle the areas where there was maybe a little more hesitation or questions about, ‘Is this even possible in my area?’” said Prineas. By the time the university had gotten to some of those more challenging areas where it was less obvious what the OER would be, “we had really honed our process and we could support those folks in helping them to develop the OER bundles.”

“Our project was from the beginning about making the materials available at no cost to the students. That doesn’t mean no cost to us.”
— Matt Prineas, University of Maryland University College

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Sharing the Goods
The university quickly understood a couple of limitations to its OER approach. First, once the course was over, students would lose access to those materials unless they’d had the foresight to download everything. Second, content was maintained in “silos” by individual courses, which hinders its discovery or reuse in other courses. So the next phase of the work is to build a repository to serve as a library of resources. The graduate school, which is still developing its course content, will be the first to take advantage of the repository. That will require tagging content, making it more searchable.

Eventually, that library of content will enable UMUC to
make as much of the content as possible openly available to everybody, current or former student, faculty member or anybody else.

Impact on Learning
As the project picked up steam, those involved came to appreciate an aspect of their work that wouldn’t be readily apparent at the beginning: Learning improved.

As courses were taught with the new resources, feedback would come in and the content would be tweaked. Likewise, the materials used by the course could change as rapidly as a given subject changes. And faculty members and students would uncover new content nobody knew about before, which could be incorporated into the next iteration of the course.

Collegiate associate professor Valorie King, a member of the cybersecurity degree program and author of a textbook, said that while she would have the opportunity to update her traditional textbook “maybe once every two years,” under the UMUC model, “I get a chance to fix things three times a year. That’s our standard schedule.”

“Especially in the IT field where things change so rapidly, we need that ability to constantly make changes and updates to the course material,” added Jeff Tjiputra, academic director for the cybersecurity program.

“We’re able to link to what students are actually doing and learning in the course in a more targeted way. What we realized more and more was that this model has real benefits in terms of improving student learning,” said Prineas. “We have a new tool for matching content to student learning, and it’s more dynamic. Although it’s more work, it also opens up new avenues for making selections for the best pieces of content for whatever learning you’re trying to achieve.”

Dian Schaffhauser is a senior contributing editor for Campus Technology.
How do you go about creating a space to support collaboration, creative problem-solving and innovation? Two institutions share their experiences. BY DAVID RATHS

Susan Metros vividly remembers the blank slate that would become the “Garage,” a new learning space for the University of Southern California’s Iovine and Young Academy for Arts, Technology and the Business of Innovation. In 2013, entrepreneurs Jimmy Iovine and Dr. Dre (aka Andre Young) had given $70 million to create a unique undergraduate program that promotes new kinds of learning through cross-disciplinary and hands-on discovery, in a fully immersive and collaborative learning space. The space for the new program, on the fourth floor of the Ronald Tutor Campus Center, was completely undeveloped.

“I remember going to a meeting and there was no electricity,” said Metros, associate dean of the academy. “We really got to start from scratch.” The space was an open canvas for innovation, yet the timeline was aggressive — with only three months for design and five months for construction.
Rethinking Design

Members of the design team, including the dean, traveled to look at other universities’ innovation spaces and maker-spaces, as well as spaces in the Newseum in Washington, D.C. In her previous position as vice provost of technology-enhanced learning, Metros had led a group charged with reimagining learning spaces on USC’s campus. “We knew we didn’t want a classroom with four walls or a lecturer in front,” she said. “We knew we wanted to have students be in a classroom where if the faculty member posed a question or challenge, the students could go and make something and bring it back to class, and not have to wait until the next week. Rapid iteration was paramount in terms of creative problem-solving and design thinking. From the beginning we knew the space had to be flexible, so that students could learn, make things and collaborate, and it had to be a place where creativity could evolve. Our dean calls it ‘accidental collisions.’”

Metros said it was important to find an architecture firm that was receptive to a different design process. USC worked with Steinberg Architects, which came in and created “mood boards” to cluster design ideas. “Instead of saying we want a place to do 3D printing or a place for students to sit and talk, we turned it around and said what is...
the feeling we would like,” Metros explained. Vetting those ideas turned out to be a challenge: Since the team was designing the space before the program started, there were no current students to offer feedback (although a few design students participated).

There were also some ideas, such as movable walls, that were deemed too expensive or impractical, Metros said. “I learned the term ‘value engineering’: We called it design and they called it embellishments.”

When the initial class of students in the program arrived on campus, one of their first assignments was to re-envision the space. What changes would they make? It is an oddly shaped space, a rotunda with a giant air vent in the middle — and the students immediately started drawing on the air vent. “It became this mural, a visual chronicle of their experiences, which is pretty cool,” Metros said.

**Access to Collaboration**

The program, which has approximately 25 students in each class, is now in its second year, and the space has received good reviews from the early students. Louis Harboe of Chicago told the USC news service that the Garage “mixes good design and good technology, which fits perfectly with the program.” And the type of collaboration originally envisioned for the space is happening, said Metros. Students now work together on projects both inside and outside class, and you can’t tell the difference, she said.

Students have been amazingly enterprising with the space, added Metros. For example, when they saw there was no place to put skateboards, they created a prototype skateboard rack out of cardboard, went to a wood shop and got certified to use it, and built and painted their own rack. “They are neat kids,” she said. “We were looking for innovative, special people and they have put the space to the test.”

Of course, there are always unforeseen challenges with new spaces. Administrators hadn’t anticipated that students would want 24/7 access. “We shouldn’t have been surprised,” Metros said, “but we didn’t have funding to have someone watch it all night. Students were finding all kinds of ways to sneak in, so we had to have a serious talk about safety and security. Students really want to be in that space.”

Metros believes more spaces like the Garage are needed. “It is surprising that universities think that students should go to a class for 50 minutes and then walk out and have no spaces that they can call their own,” she said. “They don’t have a space to go in the evenings and on weekends to really think about and critically solve problems. The Garage has become that space.”

**A Faculty-Built Space**

Sometimes faculty members can take the reins in efforts to create a different type of learning space. A few years ago, Harvard University (MA) physics professor Melissa Franklin toured the campus trying to find a space where you could actually make anything. She wasn’t very successful. But she did find some “black box” spaces where students would put on plays. One used to be a swimming pool.

“These spaces are great because they can be changed to be anything,” she said. “Nothing is fixed.”

She came up with the idea of a black box theater that is also a laboratory. “I wanted a space where it would feel like you could do whatever you wanted, and it would have an industrial feeling. Nothing would be fixed and nothing would be hard to move.”

With a grant from the Harvard Initiative for Learning and Teaching (HILT), Franklin and colleague Logan McCarty set
out to turn a 2,500-square-foot space in the Science Center into an experimental “black box” classroom called the “SciBox.” Their first move was to rip everything out — and not paint the walls. They wanted an unfinished feeling to the space, which is half-classroom, half-lab.

“I wanted it to feel like you could do anything,” Franklin said. “You can write all over the walls, and the furniture is totally light and movable. Every time people come in they change the setup.”

The SciBox opened in spring 2013. Besides a workshop, lab and classroom, the space features a “beach” — a couple of comfy couches (on wheels) where students can sit and think. It also sports a huge flat-screen TV on wheels. Although the SciBox space has been popular with science teachers, others such as drama groups use it as well. “The theater people come in and do anything, break things, which I love,” Franklin added. “The physics students are more timid, which is interesting.”

The SciBox was such a hit that the Science Center has created two similar spaces on the first floor. “We did the same thing to two classrooms, with everything movable, and I got e-mails from people saying this is what we need,” Franklin said. Those spaces also are popular with other campus groups. For instance, Franklin said, math help sessions used to be held in older classrooms with fixed desks. Freshmen would go in and sit, waiting for someone to help them and not working with each other. “I encouraged the math department to use one of these spaces at night and they said it totally transformed the help sessions.”

Franklin noted that it is not always easy to put new ideas into practice. “I have a lot of ideas, and sometimes it takes too much energy to convince people to do it,” she admitted, but she called the change to more flexible classroom spaces low-hanging fruit. “You don’t have to be a mad genius to figure this out.”

David Raths is a freelance writer based in Philadelphia.

E-Portfolio: The LMS for Students?

AAEEBL President Trent Batson explains the evolving role of e-portfolio technology in higher education. By Mary Grush

Our understanding of the e-portfolio and its application, or e-portfolio practice, is still evolving. How will the e-portfolio find its place and differentiate itself among education technologies? CT asked Trent Batson, president of AAEEBL (The Association for Authentic, Experiential and Evidence-Based Learning), the e-portfolio field’s professional association.

CT: What is the confusion about the term “e-portfolio”?

Batson: Since e-portfolio technology can support so many institutional purposes, and so many student purposes, confusion about the definition of “e-portfolio” is widespread. Some may say it’s a way to track student learning toward learning outcomes to support a re-accreditation process; others might say it’s a way to enhance the advising relationship; and still others might say it’s a way to engage students more fully in their learning process. Or a way to get a job, or to develop identity.

The list can go on. How can one technology have found so many uses?

CT: Who’s working on clarifying the term?

Batson: For 10 months, members of AAEEBL have held seminars on the topic of “What is an ePortfolio?” That
topic quickly evolved into “What is the ePortfolio Idea?” And, now, 65 authors and researchers within AAEEBL are writing The Field Guide to ePortfolio, to be published by AAC&U later this year. Note that we are using the singular version of the word “e-portfolio” to indicate it is a field of study and not just a technology.

CT: Is there one specific way of thinking about e-portfolio that captures current e-portfolio practice?

Batson: Consider the LMS as one way to conceive of e-portfolio — as a learning space — though it’s only a starting point to understanding e-portfolio. Perhaps the most important aspect of e-portfolio to keep in mind here is that it is a student-owned learning space that persists over time and is identified with the student, not with a professor or a course, but the student herself. The implications of having a student-owned space in the academic part of the institution is more revolutionary than it might seem at first.

CT: How is that revolutionary?

Batson: Student ownership of a learning space in the teacher-student interaction is revolutionary because it is saying the student is an active agent in her own learning process. And that space supersedes just one course or one instructor — it is a record of learning over time and after graduation.

CT: Why is this change in the student-teacher interaction helpful to the student?

Batson: The rhetoric of teaching and learning reveals that the action words mostly give primacy to what the teacher does. This rhetoric talks of “delivering” learning. It implies that the students are being “done unto” instead of “doing.” It talks of “content” as if the knowledge in a field or subject is done and that the student therefore has no option to add to it. In the equation of “teaching and learning,” only one half of that equation involves agency.

Yet, it is now clear from the overwhelming weight of evidence about how adults learn, that student agency is a sine qua non of learning. Without agency, students don’t have a stake in their own learning, nor is there a challenge for them to do anything other than remember (but not think). E-portfolios make student agency concrete and explicit. Students can learn out of sight of the instructor, but capture evidence of that learning so that it can all count and be visible.

CT: How do you relate e-portfolio to the LMS?

Batson: Faculty and students use the LMS for many functions in the teaching-learning dynamic, but it is always clear at any moment that the LMS is an institutional space. The LMS has become indispensable to manage the academic function of the institution.

“The student’s LMS — their learning management system — is their e-portfolio. If faculty and administrators can understand that important concept, and design uses of e-portfolios with that concept in mind, some really good things can happen. Maybe even some institutional change.

CT: What’s the main difference, then, between the traditional, institutional LMS and the idea of the e-portfolio as the student’s LMS?

Batson: The big difference is that e-portfolios have many, many faces and uses, whereas the LMS essentially has only one face.

The LMS — to generalize grandly — says, “The legacy teaching-learning ecology is here to stay.” The e-portfolio says, “Are you sure?”

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