



DESIGNED to Engage

By Diana G. Oblinger

Colleges and universities are made of many building blocks. Bricks and mortar are used to fashion quads, classrooms, and research laboratories. The spaces are designed to welcome students, invite interaction, and support scholarship. With the advent of the Internet, any space could become a learning space. The boundaries of the campus have all but disappeared.

The Internet has ushered in an age of abundance of readily available information. Yet no matter how quickly information can be disseminated or how much can be stored, our institutions are driven by connections—connections among faculty, students, researchers, disciplines, and communities. >

Although the information abundance and the connectedness provided by the Internet are critical, even greater value results from the combined use of technology and human capabilities for engagement. In an era when technology and human capabilities are being used combinatorially, colleges and universities have the opportunity to use not only their traditional capabilities but also their digital ones to design deeper engagement for higher education and society.

Engagement

Today, all aspects of a college or university's experience and its operations are supported by technology. The challenge is to move the use of technology beyond automation to engagement. Administrative and academic systems generate data that can feed analytics tools, which in turn can help optimize campus services, improve data-led decision making, personalize learning, and inform how best to support at-risk students. The ability of digital technologies to facilitate connections and interactions, and to generate observable data about the connections and interactions they facilitate, allows institutions to identify and capitalize on efficiencies and ways to improve effectiveness, transforming how we work and learn. For example, well-designed system interfaces can promote self-service, speeding transactions and reducing personnel costs while increasing user satisfaction. In the learning context, technologies can make activities not only more

flexible across time and distance but also more interactive and engaging, such as when social media enables learners to sustain dialogue and share knowledge outside class and across institutions.

Engagement is critical for higher education and its many stakeholders. Engagement implies a dynamic relationship between the individual and the institution; the individual participates in and is more involved with the institution. Engagement is a powerful predictor of success. For example, increased student engagement leads to higher levels of achievement, greater likelihood of graduation, and deeper satisfaction. More-effective alumni engagement correlates with more giving and support. Regardless of the stakeholder group (e.g., faculty, staff, students, alumni, the general public), increased engagement fosters a deeper sense of being an integral part of the institution—its mission, history, culture, values, and goals. The expanded and enhanced vibrancy that results creates network effects that multiply the potential benefits (personal, financial, reputational) for all members of the institutional community.



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Many new learning environments foster student engagement that transcends memorization, immersing students in problem solving, collaboration, and active exploration and allowing them to construct, share, and transfer knowledge, not just recall it. Engaged and authentic learning experiences help connect learners to scholars and researchers, to workplaces and industries, to local communities, and

to global challenges. Engagement is associated with gains in academic, personal, and social development. Immersive learning experiences (e.g., through augmented reality, simulations, and other tools) move beyond “teaching information” to helping students develop the valuable skill of “transfer”—being able to take what they know and apply it to a new area.¹

Technology provides many engagement tools that go beyond what is possible face-to-face. Mobile and wearable devices allow users to extend their capability, memory, and interaction. According to the World Bank, 75 percent of the world's population had access to a mobile device in 2012.² Just about anyone anywhere can connect.

Mobile devices have catalyzed changes, such as voice activation, that make the user interface more engaging. Many apps too now engage users. For example, Waze, a traffic and direction app, combines data from street maps and GPS with information shared by users.³ Yet engagement can go much further than inviting users to contribute information. Distributed innovation platforms (e.g., Quirky, Innocentive) tap the creativity and opinions of millions.

Even our computing platforms are engaging us. For example, with cognitive computing, the computer uses natural language processing, artificial intelligence, and machine learning so that it can learn rather than being programmed. The goal is to augment human capability. Rather than man versus machine, it is man *and* machine.⁴ Combing through the best that technology and humans have to offer in higher education could bring exponentially greater value than the status quo. Achieving that potential, however, will require us to design for engagement—creating a design that integrates the material and the digital.

Digital engagement could be used to describe the extent to which a college or university uses digital technologies and systems to connect and interact with students, faculty, and other stakeholders in ways that effectively advance individual

and institutional objectives. In a world that is both online and face-to-face, engagement is not an either-or proposition—it is about how to blend the best of both worlds to engage stakeholders. Many institutions begin by creating a digital presence, then move to digital engagement. Ultimately, the goal is digital integration whereby the physical and the virtual worlds become seamless.

Combinatorial Opportunities

If we were to start from scratch today, much of our resulting design of higher education might resemble our current institutions. The difference is that we would also use technology to create digital engagement that augments, enhances, and extrapolates what we can do face-to-face.

For example, the availability of huge amounts of data should help people better understand complex situations. John E. Kelly III and Steve Hamm note: “The emergence of social networking, sensor networks, and huge storehouses of business, scientific, and government records creates an abundance of information . . . a parallel universe to the world of people, places, things, and their interrelationships. . . . The volume of data creates the potential for people to understand the environment around us with a depth and clarity that was simply not possible before.”⁵

Future-oriented institutions are combining the strengths of the campus with their computing capabilities—whether analytics, visualization, social media, or interaction—to more deeply engage their stakeholders and solve the world’s most challenging problems. The campus and computing are coevolving. One does not replace the other. We have the opportunity to use technology to overcome limitations, such as our ability to gather and process massive amounts of information or make better decisions. Likewise, we can use sensors and pattern-recognition software to augment our senses.⁶

Although each institution must select its own design parameters to align with its mission, culture, faculty, and students,

design for digital engagement can be illustrated in three areas:

- *Complex Problem Solving.* Because technology has changed the nature of work, complex problem solving is a necessity in today’s world. Higher education needs tools that support the deep engagement and learning required to develop this skill.
- *Customization.* Engagement implies personalization and individualization. One-size-fits-all is rarely engaging, especially with multiple student segments. If the institution is addressing the student’s needs, the student will be more engaged and more successful.
- *Clouds and Crowds.* Technology has made it possible for many applications to live in the cloud. Access is more important than ownership, whether for infrastructure or service. And thanks to the global reach of technology, the power of millions of people can be applied to problem solving and innovation.

Complex Problem Solving

One of the critical skills of the 21st century is the ability to solve complex problems that are often ill-defined and require knowledge of multiple disciplines. Solutions to these problems require learners to use both analytical and creative skills, often integrating mathematical, scientific, social, and cultural elements. Digital learning experiences can be important tools for this type of complex problem solving. However, Kurt Squire

warns: “Publishing content online is not synonymous with improving learning or performance.”⁷ A better option is the use of simulations, scenarios, and serious games as experiential learning spaces.

Game-based learning epitomizes many qualities of digital engagement and can serve as a new e-learning model that focuses less on content and more on designing experiences to stimulate innovative ways of thinking, problem solving, and collaboration. Games are highly interactive; they are co-constructed by users, whether individually or in distributed communities. As Squire adds: “With games, knowledge is not presented to the learner but arises through activity.”⁸ In addition, games can be more than a learning activity: they can provide insight into the *process* of learning. New

technologies can capture complex human interactions for feedback and assessment. Anya Kamenetz notes that in some games, for example, “the telemetry can extend to logging players’ breathing, heart rate and facial expressions.”⁹

One example that combines game technologies with artificial intelligence is Crystal Island, a science mystery in which students try to find the source of an infectious disease that has a research team stationed on a remote island. In the role of medical field agents, students investigate the disease, manipulating virtual objects, testing potential transmission sources with laboratory equipment, interviewing scientists, and using other resources. Students uncover details about the spreading infection, testing potential

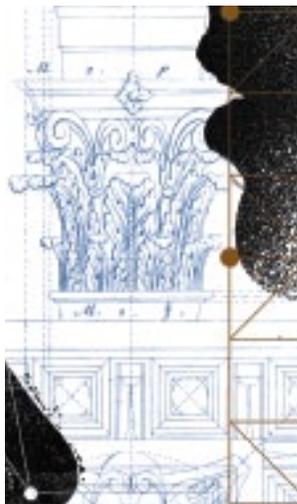


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transmission sources of the disease, recording a diagnosis and treatment plan, and presenting the findings to the camp nurse. The system can provide students with a hint-centered approach or can offer full guidance from “wizards.” The full-guidance approach resulted in the greatest learning gains, a finding consistent with other research showing that students who receive problem-solving guidance during inquiry-based learning achieve better learning outcomes than students who receive minimal or no guidance.¹⁰

Intelligent game-based learning environments such as Crystal Island use both intelligent tutoring systems and intelligent narrative technologies to create personalized learning experiences. Intelligent tutoring systems model one-on-one human tutoring to individualize learning experiences; they can dynamically customize problems, feedback, and hints to individual learners. Intelligent narrative technologies model human storytelling and comprehension processes. With the critical role of narratives in human cognition and communication, interest in computational models of narrative is increasing.¹¹

Psychometricians are also working with game designers on evidence-centered game design and dynamic testing to assess “fluid” intelligence—that is, the capacity to think logically and apply reasoning in novel situations. As Kame-netz explains: “You can become more



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intelligent by continuously tackling new challenges in new ways.”¹² Game-based learning and simulations are thus not just engaging; they are important because practice helps develop expertise. Combining live and virtual environments can accelerate learning.

One example is TLE TeachLivE (<http://teachlive.org/>), a mixed-reality classroom simulator created at the University of Central Florida. Much like a flight simulator, TeachLivE simulates a classroom experience for teachers to learn from their mistakes in a low-risk, virtual environment. Teachers walk into a room that looks just like a classroom, including desks, books, whiteboards, and students; however, unlike the brick-and-mortar setting, the lab is combination of real and virtual worlds. Students are virtual characters with personalities typical of real-life students: a mix of passive and aggressive

and independent and dependent characteristics. During a TeachLivE session, teachers can practice asking content-related questions, using behavior-management techniques, and explaining challenging content—all with virtual students who respond based on the session objectives. TeachLivE aids teacher performance, recruitment, and retention and has potential applications for K–12 student peer learning.¹³

Another example is LearningEdge (<https://mitsloan.mit.edu/LearningEdge/>), a set of simulations of complex

systems—such as renewable resources, clean energy, and commodity pricing—that allow students to connect the dots between their decisions and the consequences. Role-playing as senior managers in highly competitive industries (e.g., solar energy, hardware platform producers) or as founders of tech start-ups, students explore risks and negotiate agreements. The resources, developed by the MIT Sloan School of Management, are freely available online.

Intelligent tutoring systems and games can be expensive. Other forms of intervention can be effective as well. Part of the value of games and simulations comes from repeated knowledge retrieval, practice, and feedback. These cognitive practices can be integrated into courses in other ways. For example, Rice University developed an assignment-intervention process that required minimal change to the overall course. Students were provided with repeated opportunities to retrieve and use their knowledge through a schedule of spaced practice; they were also required to view timely feedback in order to reinforce their knowledge and correct their errors. The process could be adopted in any course. First, students were given homework problems; feedback was immediate. The students did not receive credit for the work unless they viewed the feedback. Similar problems were repeated in homework over the next two weeks to provide additional practice and feedback. This combination of small but important changes to standard practice boosted student learning and retention.¹⁴

Customization

Colleges and universities cannot be all things to all students. Higher education institutions have varying capabilities. Likewise, students have varying needs. Students differ based on educational aspiration, preparation, age, motivation, self-confidence, sense of belonging, and financial support. Students also have many intrinsic and extrinsic needs that combine to form barriers:

- Skepticism about the value of a college/university education
- Inability to see a path between a college/university education, the choice of a major, and a career
- Lack of a sense of belonging
- Too much socializing paired with too little attention to coursework
- Lack of confidence in academic ability
- Insufficient knowledge about college/university or insufficient family support
- Financial concerns¹⁵

Engagement requires close alignment between students' needs and program design. Examples of student profiles illustrate how needs might align with program design:

- **Aspiring academics (24%):** These "traditional" college students are well-prepared, academically driven, and likely to have plans for post-graduate work. They may engage through research experiences and close student-faculty contact.
- **Coming of age (11%):** These students are not sure what they want to be when they "grow up," but they have the time and desire to explore. They can be engaged through broad academic experiences.
- **Career starters (18%):** These job-oriented students use higher education to reach their ideal career position in the shortest amount of time possible. They

may be price-sensitive, and they value placement services.

- **Career accelerators (21%):** Mainly working adults, these students aim to advance their career at their current company or within their current industry. They are likely to be interested in receiving credit for prior learning, and they value online delivery.
- **Industry switchers (18%):** Starting a new career in an entirely different field is the primary motivation for these students. They are engaged through institutional linkages to employers and through preparation for a transition in careers.
- **Academic wanderers (8%):** These students don't know what they want from higher education, but they believe that a degree is their path to the future. They tend to be unemployed, and form the most "at risk" segment.¹⁶

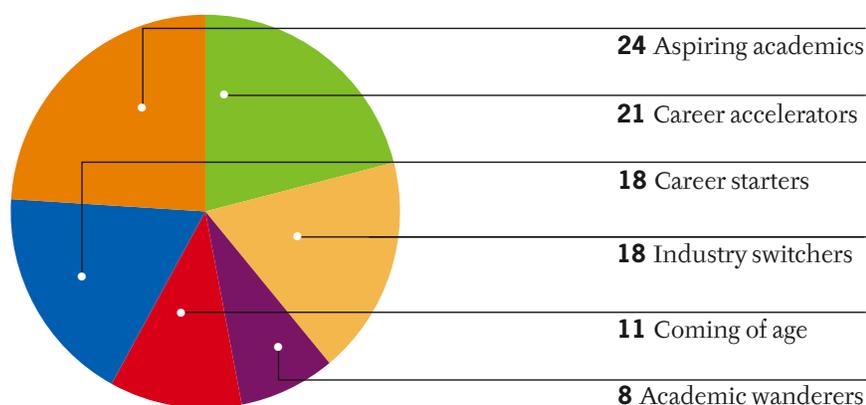
With personalization and individualization as the ultimate goals, specific programs illustrate how a blend of the campus and computing can help institutions move from broad to more customized approaches. For example, many students need help linking college with work. Montgomery County Community College's Career Coach (<http://www.mc3.edu/student-resources/224>) is designed to help students find a suitable career by providing current local data on wages, employment, job postings, and associated education and training. Students select their career of interest

and are provided information about employment prospects, job opportunities, income potential, and the education and training available at the college.

Faculty and advisors alone cannot customize each student's experience; technology can help. Advising and coaching systems can help identify the support that students need and link them to information, intervention, and coaching. Tools can help students develop personal action plans, along with sending reminders and setting up tracking mechanisms. Case-management tools can help advisors, faculty, and others share necessary actions and observations.

Degree-planning services help students select courses and move efficiently through their program of study, often reducing the time to degree, whether at their current institution or through the transfer of credits at another institution. Planning tools, which typically track students' progress, can improve the use of advisor time and can reduce errors. Sinclair Community College's Student Success Planning Services (<http://www.sinclair.edu/support/success/>) provide students with guidance about how to achieve their academic goals. The software components (case management, early alerts, action plans, reference guides for referrals, student self-help tools, and My Academic Plan) help students, advisors, and student-support professionals navigate successfully to program completion. Each student is given an individualized, clear, and coherent pathway to degree completion. The system helps prevent course-selection confusion and degree misdirection, and it demystifies many issues, saving both the student and the institution time and money.¹⁷

For some students, too much choice can be the enemy of success. The Degree Compass system at Austin Peay State University (<http://www.apsu.edu/information-technology/degree-compass-what>) analyzes hundreds of thousands of student grades—as well as each student's personal academic achievement, requirements for the



current program of study, and graduation requirements—to make personalized recommendations for courses that meet degree-completion requirements and in which the student is likely to succeed (earn an A, B, or C grade). This information is available to advisors as they work with students not only to register for courses but also to explore degree options. Degree programs identify “fingerprint” courses—those courses that tend to determine a student’s success within a discipline. If Degree Compass predicts that a student will do poorly in these fingerprint courses, the likelihood of success within that major is low. Advisors and students can then rank the options based on the best fit for the student.

Data from a variety of sources can feed analytics tools, which use predictive algorithms to identify at-risk students and trigger interventions in the form of alerts to faculty, advisors, or students. The alerts serve as an early-warning system to help students know when their course success (grade) may be at risk and to advise them about available resources and suggest specific actions. Intrusive advising systems are designed to alert students who are unaware that their success is at risk. These analytics-based programs increase students’ awareness of their class standing and the likely outcome of the course. The messages instigate behavior changes, with the goal to teach students how to learn. Alternatively, alerts might provide

encouraging messages to students who are doing well.

The majority of today’s learners are nontraditional students (e.g., adult learners); they are often first-generation college-goers, unprepared for college, with significant financial need. For these learners, college is not a time-out; it is an obstacle course. For example, 72 percent of U.S. undergraduates worked while in college in 2011, with about one in five undergrads working at least 35 hours a week year-round.¹⁸ A statistically typical student at a public two-year college in the United States is a white female who

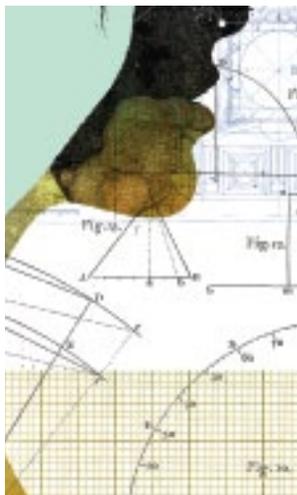
may have children or other dependents, who works 32 hours a week to meet expenses, and who relies on financial aid to help fund her education.¹⁹ Changes can drive new consumption patterns, which may change what learners need from colleges and universities. Such educational “customers” may be overserved by the traditional higher education value proposition and may seek alternatives, such as competency-based education (CBE).

A growing number of programs are using CBE to serve post-traditional students, such as working adults. CBE takes advantage of the potential of online learning, enabling models that can reduce both the cost and the time needed to earn credentials. CBE awards academic credit based on demonstrated mastery of clearly defined competencies, strengthening the linkage between education, employers, and the workplace. Formative

feedback is a frequent and integral part of the learning experience, rather than mid-term or end-of-term tests. Students proceed to new material when they have satisfied the measured learning objectives. In CBE, learning is not structured around seat time and the credit hour. Learners work at their own pace, taking as much or as little time as they need to understand the material. Competency-based programs can recognize prior learning and learning outside the scope of a course—regardless of where, when, or how that learning took place.²⁰

Northern Arizona University’s Personalized Learning initiative (<http://pl.nau.edu/>) is a competency-based approach to a bachelor’s degree in which students will be pre-tested to ensure proper placement and will be awarded credits for prior learning. A flat six-month fee of \$2,500 and no credit accumulation restrictions incents students to complete their degree. Students receive support from mentor faculty, and a Personalized Learning Dashboard provides them with clear indications of progress at any time. There are no additional charges for books or fees. NAU was one of four institutions selected by the Higher Learning Commission (its regional accreditor) to participate in a direct assessment pilot group.²¹

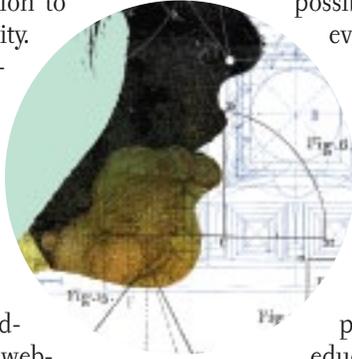
Southern New Hampshire University’s College for America (<http://www.collegeforamerica.org>) is a self-paced, online, competency-based associate of arts degree program. Students develop evidence to demonstrate mastery, documenting progress in an online Knowledge Map. After graduation, competencies may be mapped to traditional course credits for continued academic pursuits. The program launched in 2013 with a general studies degree, priced at approximately \$2,500 per year. The first graduates received their degrees in June 2013; one student completed the program in under 100 days. College for America was the first fully competency-based program to gain approval from the U.S. Department of Education to offer federal financial aid for direct assessment.²²



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Clouds and Crowds

College and university missions extend beyond the campus to local, state, national, and international communities. The goal is to leverage the education, research, and cultural heritage entrusted to higher education to serve the broader community. To be effective, institutions must do more than provide information—they must engage society more broadly. Information technology provides the mechanism for higher education institutions to be known and engaged, worldwide, thanks to the Internet, websites, and other applications. “Clouds and crowds” may provide colleges and universities with efficient and inexpensive ways to maintain and expand their value in society.



Clouds represent the ubiquitous large-scale technological infrastructure of contemporary society. Clouds are everywhere. They can alter relationships and organizational boundaries, as well as expectations of what is possible. They are a part of everyday life—on and off campus.²³

Clouds make scaling education possible. MOOCs, for example, use the cloud to reach a global audience. MOOCs hold the promise of affordable education for anyone who can connect to the Internet, worldwide. Some institutions are investing in MOOCs to identify potential students with the most talent. Others are motivated by extending their brand

through MOOCs. Engaging with learners through this education and enrichment tool is a more nuanced way of building rapport and reputation with those outside the institution than a static website or advertisements.

Clouds enable the storage and use of digital surrogates for analog resources as well as “born-digital” resources. Being “digital” provides new methods for scholarship and collaboration. For example, CLIR President Charles J. Henry writes that digital surrogates for the 130 extant medieval manuscripts of the poem *Roman de la Rose* “can be analyzed, read, searched for patterns, and interpreted either as a corpus or by select collations. One generation ago . . . these manuscripts were accessible only in analog form and were scattered across Europe and the United States. It would have taken a scholar many lifetimes to find and read them all.” Not only is

access more convenient today, but a different form of engagement is now possible. This kind of post-digital inquiry “affords the scholar and the student new opportunities to test hypotheses, ask questions, and approach the poem with a more encompassing frame of reference.”²⁴

Digital scholarship can catalyze greater engagement because, as Middlebury College CIO Michael Roy explains, “the products of digital scholarship are often digital works that can be integrated into the classroom experience, offering important access to primary-source materials and, in many cases, providing new tools and analytical forms that can be assigned alongside traditional secondary literature.”²⁵ The nature of digital scholarship allows for remix and reuse not possible before. Lafayette College President Alison Byerly notes: “It can also uncover “patterns or information

that would otherwise remain invisible.”²⁶

The term *generative scholarship* describes how these digital and visual resources can be used by researchers, instructors, and students at all levels. “Visualizing Emancipation” (<http://dsl.richmond.edu/emancipation/>), a project of the University of Richmond’s Digital Scholarship Lab, is an interactive mapping tool that brings layers of data together, allowing users “to explore the different places, times, and ways that slavery collapsed in the American South.” Building on an archive of traditional sources—including military records, newspaper stories, letters, and diaries—the site documents various “emancipation events” that occurred between 1861 and 1865. Blue dots on a map of the United States show where the Union Army was positioned at any given time; red dots show emancipation events. Users can click on the red dots

to see details about an event and the original source of the data—with each dot representing one of the thousands of individual stories that collectively recount the dramatic experience of the end of U.S. slavery. Visualizations can represent patterns better than can words alone. They permit users to understand how actions overlap, penetrate, and conflict with one another, making it possible to see interaction between geographic layers of legal enactments, military control, and shifting demography.²⁷ An animation feature on the map allows users to see the unique interplay and changing patterns related to categories over a period of time—for instance, more emancipation events between the military and enslaved people near waterways or an increased pattern of war-related abuse of African-Americans after formerly enslaved black men started fighting for the United States.

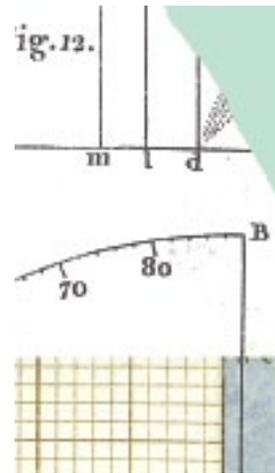
Patterns in the data can be explored as users filter events based on dates, keywords, or types of primary source.

Clouds also provide access to “crowds,” meaning that the work of thousands of people can be combined in new ways. The coauthors of *The Second Machine Age* write: “The best way to accelerate progress is to increase our capacity to test out new combinations of ideas. One excellent way to do this is to involve more people in this testing process, and digital technologies are making it possible for ever more people to participate.”²⁸

Crowds have thus become potential problem-solvers and innovators—both significant forms of engagement. In the article “Crowds, Clouds and Community,” Cynthia Stohl notes: “Studies have shown that crowds can save organizations money, transform research and development processes, facilitate

innovation, and create a new generation of entrepreneurs who no longer work within traditional labor markets and the constraints of traditional labor contracts.”²⁹

Many research institutions have a history of engaging the public in “citizen science.” Citizen science involves amateurs who collect and analyze data, typically through crowdsourcing. It allows the public, of all ages, to participate in research. Volunteers partner with research teams to collect data and learn new skills, acquiring a deeper understanding of science on an issue of common concern. For example, the Globe at Night program (<http://www.globeatnight.org>) is an international



citizen-science campaign to raise public awareness about the impact of light pollution: citizen-scientists measure their night sky brightness and submit their observations to a website from a computer or smartphone. In another example, the citizen neuroscientists in EyeWire map neural connections by playing a game. Players help identify the twists and turns of neurons to build

up a map of the complex connections involved with vision. Begun in 2012, the MIT project had 100,000 players within one year.³⁰

The power of crowds is also seen in the University of Washington’s Foldit (<http://fold.it/portal/>), a protein folding

game and research project that aims to fight disease. Its goal is to improve the speed of discovery using crowdsourcing and community collaboration. Protein folding is highly dependent on pattern recognition—a particular skill of humans. The tool combines distributed computing with the power of “crowds” to solve problems. Players are asked to contribute cycles from their computers when not in use through a program called Rosetta, which provides additional computation cycles for these complex visualizations. Online gamers also compete to solve scientific problems. For example, a protein causing AIDS in rhesus monkeys—a protein structure that hadn’t been solved for fifteen years—was resolved by Foldit players, then confirmed by x-ray crystallography.

Innocentive (<http://www.innocentive.com>) serves as an online clearinghouse for scientific problems using crowdsourcing. Anyone can browse the problems, download data, or upload a solution. In a study of unsolved scientific problems posed to Innocentive, the “crowd” was able to solve 49 of the 166 previously unsolved problems, a success rate of nearly 30 percent. Interestingly, those who solved the problems had expertise quite different from the apparent domain of the problem.³¹

On the Path to Digital Engagement

Digital engagement promises to extend and enhance the college/university experience. Among the conceptual challenges institutions will face is moving beyond the tension of man versus machine, toward the goal of optimizing man *and* machine. To achieve digital engagement, higher education institutions will transition through at least three phases:

- **Digital presence.** Digital presence requires that the appropriate technological platforms, applications, systems, and interfaces be in place. Transactions must be available online, and information must be

readily available, whether on the web or via a mobile device. All touchpoints should provide a consistent experience of the institution.

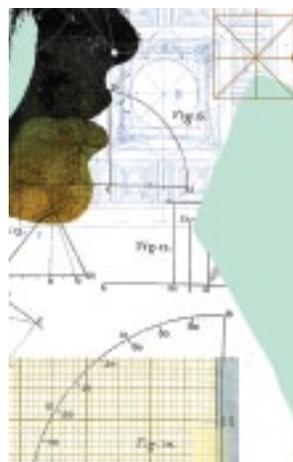
- **Digital integration.** Digital integration goes a step further, ensuring that the platforms, applications, systems, and interfaces are integrated. Data must flow from one application to another.
- **Optimization.** To achieve optimization, institutions must ask whether they are capitalizing on the best of the physical and the virtual, leveraging the unique capabilities of both. Stakeholder connections and interactions should be designed to advance the institution’s mission and goals in teaching and learning, research and discovery, and outreach.

All colleges and universities have a digital presence. Many are now in the phase of digital integration. To reach the next level, these institutions must go beyond an institutional strategy that links to a technology strategy; they need a digital engagement strategy to optimize the college or university “experience.” A digital engagement strategy presents a vision for how the institution manifests itself online and via technology-mediated functions to assure stakeholders of seamless, successful connections and interactions—with the institution, with other stakeholders, and with the global communities and resources stakeholders might tap to accomplish their goals.

The collection of technology-mediated connections and interactions that define the institution’s identity in the eyes of the stakeholders should be part of the digital engagement strategy. Members of the campus community experience their institution digitally—through the interconnections that institutional websites, online and mobile applications, and technology-mediated tools and services foster. All aspects of the institutional technology environment

(e.g., live, social, online, mobile) should complement one other. The strategy should also consider the core needs and objectives of different stakeholder communities—students, alumni, faculty, prospective students, and potential donors, to name a few—and how the institution’s technology environment thwarts, facilitates, or fulfills those needs and objectives.

Finally, a higher education digital engagement strategy must look beyond transactions to consider how the institution’s use of “digital” uniquely enables and motivates individuals to actively engage in a community—not only at the institutional level but also as part of the wider academic community. The strategy must help the institution use technology to move beyond automation to engagement—to the connections and interactions that could not be achieved and sustained without digital technologies.



A digital engagement strategy presents a vision for how the institution manifests itself online and via technology-mediated functions to assure stakeholders of seamless, successful connections and interactions.

Conclusion

The future of higher education is more than a digital replica of yesterday's campus or even today's classroom. The building blocks of our future higher education institutions are physical and virtual; they are human and technological. By combining these capabilities—the best of both the traditional (the campus) and the digital (computing), we can build colleges and universities that are *designed to engage*, thus bringing us closer to achieving the mission and goals of higher education. ■

Notes

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