Why IT Matters to Higher Education

EDUCAUSE review

MAY/JUNE 2017

STUDENT SUCCESS

Thomas Bailey
Heather Hiles
Kevin Kruger
Rebecca Martin
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John O'Brien

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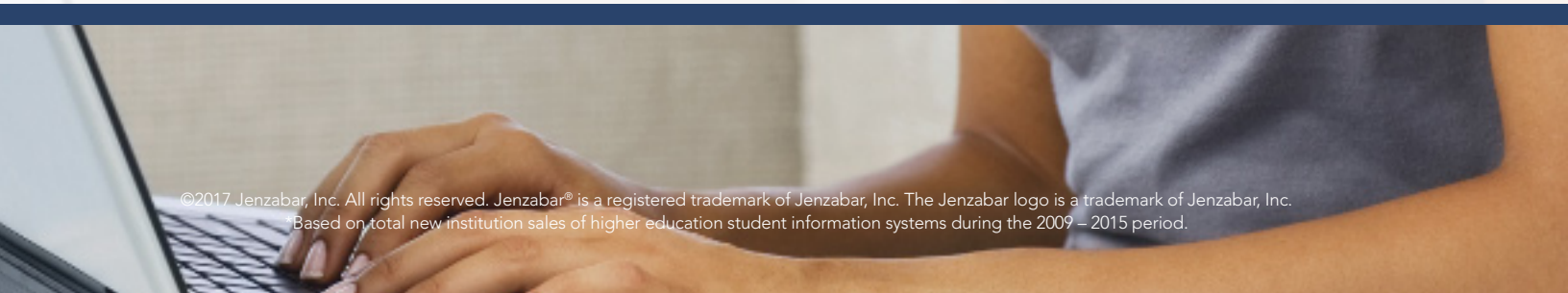

*Based on total new institution sales of higher education student information systems during the 2009 – 2015 period.

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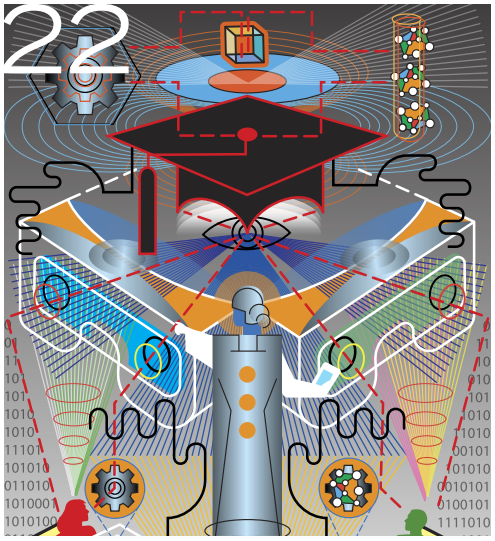
MAY/JUNE 2017 VOLUME 52, NUMBER 3

FEATURES



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EDUCAUSE Review is the general-interest, bimonthly magazine published by EDUCAUSE. With a print publication base of 22,000, *EDUCAUSE Review* is sent to EDUCAUSE member representatives as well as to presidents/chancellors, senior academic and administrative leaders, non-IT staff, faculty in all disciplines, librarians, and corporations. It takes a broad look at current developments and trends in information technology, what these mean for higher education, and how they may affect the college/university as a whole.

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FAST COMPANY 2017 50 MOST INNOVATIVE COMPANIES

By JOHN O'BRIEN

The Future of EDUCAUSE, Part 2: User Experience and Personalization

Several days before the 2008 U.S. elections, I received a widely emailed video. Set in time three days after the elections, it was a fictional news story in which the presidential win was decided by one nonvoter. The supposed nonvoter? Me. Frame after frame included some cleverly customized element embedded into the video: a Facebook page announcing "10 million strong against John O'Brien"; a *New York Times* headline ("Nonvoter Identified: John O'Brien"); and, my favorite, a photo of a church sign: "All God's Children Welcome—except John O'Brien." Even a goat herder in a remote country said: "I cannot believe John would allow this to happen." Clever and entertaining, the video completely captured my attention. It was my first realization of the power of personalization.

In 2017, personalized features are ubiquitous. If you listen to streaming music from Pandora, watch TV shows or movies through Netflix, or shop on Amazon, you've already experienced firsthand the kind of leading-edge personalization that many millions in investment dollars can create. These companies are relentlessly honing and perfecting the algorithms that drive their personalized experience. In 2006, Netflix famously offered a million-dollar prize to anyone who could best its existing filtering algorithm.

We have taken on, as one of our three strategic priorities, the mission of broadly personalizing the EDUCAUSE member experience.

As personalization continues to shape the business landscape, we believe it's time for EDUCAUSE to join the evolution. We have taken on, as one of our three strategic priorities, the mission of broadly personalizing the EDUCAUSE member experience. Driven by our stated goal to make it possible for our members to "discover, share, and build on resources individually and in communities," we are engaged in crafting a user experience that is tailored to an individual's tastes and preferences. This experience is enabled and fueled by data, both the data our members will eventually be able to embed in their EDUCAUSE profiles and the data we gather (with members' permission), such as resources downloaded, EDUCAUSE events attended, and sessions prioritized. Ultimately, the level of personalization that EDUCAUSE can provide will be directly proportional to the amount of data our members share and how accurate and up-to-date that data is.

This year we are finishing up important foundational projects to enable us to develop this kind of personalized experience. We completed an overhaul of our association enterprise systems, moving from a legacy system to one that will allow us to access and leverage our member data more easily and effectively. We have redesigned our website to make future personalization possible, and we've piloted new technologies, like beacons, while attending to data governance and data quality. The EDUCAUSE board and executive team have also been talking about a longer-term vision. The future scenario on the next page shines a light on the personalized experience we are planning to create over the next three to five years. This imagined vision will not be simple to realize, but we are thrilled to be embarking on this work. After all, next year will be the 20th anniversary of the merger that created EDUCAUSE. Then and now, our core competency and fundamental strength come from the connections we make and the resources we create and share to solve problems and advance our profession. Ambitious as this personalization vision may be, it will be shaped over time by input and ideas from our members. It continues and builds on everything that has made EDUCAUSE such an inspiring community.

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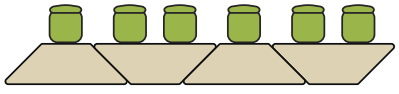
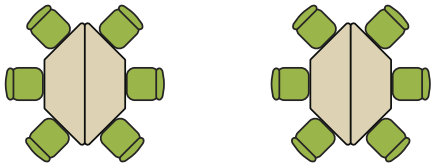
Active Learning Cluster goes Mobile

Create Flex-Labs with the NEW Mobile Active Learning Cluster



Additional ALC-M Sample Configurations
Accommodates Large or Small Groups



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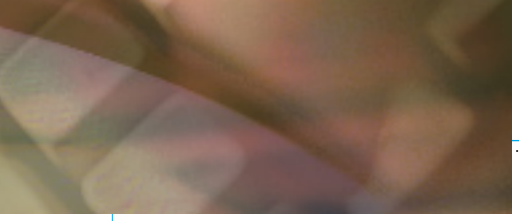

(continued from page 4)

The EDUCAUSE Personalized Member Experience

Yuki works in the IT department at a member institution in the EDUCAUSE community, but she doesn't participate heavily. Her supervisor has asked her to take on some additional cybersecurity responsibilities (an area where she has less experience) and suggests she use some work time to learn what she can. Since all college and university members have full access to EDUCAUSE Center for Analysis and Research (ECAR) research and reports, she decides to start by visiting the EDUCAUSE website.

Using her InCommon login, Yuki quickly creates a member profile and selects cybersecurity as one of her current primary interest areas, opting in to receive additional communications from EDUCAUSE based on her interests and interactions. She browses a number of research articles, and she bookmarks some cybersecurity-related research for later exploration. The next day, Yuki gets an email from EDUCAUSE about a new campus security article in the latest issue of *EDUCAUSE Review* and new resources in the member-created *Information Security Guide: Effective Practices and Solutions for Higher Education*, both of which she marks for later use.

Yuki downloads the EDUCAUSE app to her mobile device and immediately discovers a thriving community of other EDUCAUSE members and connections, including some who have similar responsibilities and areas of interest and others who work for institutions facing challenges similar to Yuki's.

The following week, Yuki receives an app alert from EDUCAUSE suggesting she attend the upcoming 2019 Security Professionals conference and offering her a 10 percent discount as a first-time attendee. She checks with her supervisor and decides to attend the event. In addition, Yuki opens the EDUCAUSE app and drops a hello to three of the suggested colleagues also attending the conference.

Yuki is pleasantly surprised when a week later, she receives an email from the volunteer leadership of the EDUCAUSE cybersecurity community, inviting her to join and participate before she attends the conference. She also gets notes back from two of the app connections and is delighted to schedule lunch with one of them during the conference.

After accepting the volunteer invitation and joining the cybersecurity community, Yuki reads some of the community discussion archive, finds some helpful pointers, and identifies a couple of specific areas she'd like to focus on during the conference.

The day before departing for the conference, Yuki is pleased to see another email from EDUCAUSE, providing a suggested itinerary for her time at the event based on her stated profile priorities and informed by her activity. The schedule highlights opportunities for first-time attendees, basic/introductory-level sessions that will give Yuki the most value, a number of additional suggested connections who will be attending the event, and even an optional sponsored networking reception designed specifically for newcomers.

After the conference, loaded with information and business cards from her new contacts, Yuki returns to work feeling confident and engaged and looks into how she can participate even more in her new community.

John O'Brien (jobrien@educause.edu) is President and CEO of EDUCAUSE.

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Mobile Technology Meets Mindful Technology

As a young professional, I used alliterations in my journal articles and presentations. I thought they were cool and catchy linguistics devices. Today, I use them as mnemonic devices to help myself (and those I am writing for and speaking with) remember an interesting theory or concept that might otherwise get buried in our information-saturated minds.

In that vein, I have started to use four Ps—purposeful, pragmatic, proportionate, and present—to describe the mobile technology program we are launching at Hiram College. I hope these Ps provide a constructive framework for appreciating how and why Hiram wants "mindfulness" to be the definitive feature of this initiative.

Tech and Trek

Thanks to a $2.1 million gift from Hiram College Trustee Dean Scarborough and his wife, Janice Bini, we will launch a 1:1 mobile program (one mobile device for every person) in the fall of 2017: Tech and Trek. Officials had deemed such a program a priority because students already use their smartphone or tablet to interact with friends, download films and games, stream music and videos, order clothes and food, and more. For today's digital natives, using devices in the college classroom is largely an extension of an online life they know well.

High school students are not the only ones who expect to see and use various technologies. The increasingly normative nature of technology has also heightened parents' expectations that their sons and daughters will have access to technology throughout the K–12 years.[1] It should come as no surprise, then, that these parents expect at least the same level of technological access from the colleges and universities they and their teenagers are considering for postsecondary education.

To meet this expectation, Hiram College's program will issue an iPad Pro, Apple Pencil, and keyboard bundle to full-time students in the undergraduate college, as well as to faculty and staff. In doing so, we will become the first four-year college in Ohio and one of a just a dozen or so nationally to implement a 1:1 mobile program. As we make our foray into this realm, Hiram's faculty and administrators are committed to designing the program in ways that go well beyond the broad distribution of contemporary gadgets. Our plans have quickly galvanized around the idea of "mindful technology"—teaching students how to *creatively* and *critically* use technology to augment classroom learning, navigate the literal and figurative treks that constitute their college experience, and prepare for the 21st-century workplace. Tech and Trek will be framed by the four Ps, described in more detail below.

Mindful Technology and the Four Ps

First is *purposeful*. Perhaps the most fundamental aim of Tech and Trek is to further enhance interactive pedagogies. It is rarely the case that Hiram students sit through a "sage on a stage" lecture; instead, flipped classrooms that foster intimate and interactive teaching, learning, and sharing are the norm. Given this norm, faculty are considering modifying and redefining key classroom activities in the SAMR model:

- *Note taking:* utilize apps like Notability to compile and organize online resources and Evernote to create, access, and share notes at all times with all people.
- *Researching:* use apps and other tools that help students find, store, annotate, transfer, manage, and sync files, PDFs, websites, and more.
- *Presenting:* design state-of-the art multimedia presentations, produce iMovies, and create dynamic presentations.
- *Delivering content:* display interactive and manipulable real-world environments whose elements are enhanced by the digital sounds, computer-generated graphics, and GPS data of AR (augmented reality) apps.
- *Authoring interactive documents and books:* replace static texts and pictures with dynamic images that can be rotated; students can highlight text, take notes right on the document, and easily search for content.
- *Sharing and managing course files:* store course materials in a shared folder that students can easily access, or ask students to collaboratively work on a shared spreadsheet or presentation as part of a group project.[2]

The use of technology in any one of these ways will help students assimilate personal observations, textbook theories, and interdisciplinary perspectives and methodologies. Doing so will integrate their learning and sharpen the very skills thought to be diminished through a perfunctory use of technology. Indeed, Tech and Trek will help students develop the real-world and real-time skills of oral communication, teamwork, problem-solving, critical thinking, and civil discourse with the classmates sitting next to them at any given moment.

The second "P" is *pragmatic*. Tech and Trek will allow students to develop a contextualized, material understanding of and/or make practical improvements in the real-life situations

By LORI VARLOTTA

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associated with the fieldwork, internships, study-abroad, and clinical treks they take at Hiram. On study-abroad trips, for example, mobile technology will help students capture and reflect on the life-changing experiences they encounter in a foreign country. Their travel journals will come alive with photo- and video-enhanced entries. Their real-time understanding of historical buildings and natural wonders will be sharpened as they immediately access location-aware apps to answer on-the-spot questions. Later they can use wikis, Twitter, and other forms of social media to send to friends and family, thousands of miles away, the multimedia presentations they created minutes before. All of this deepens and memorializes their learning.

There will also be iPad-powered experiences for those who earn credits through service-learning, internships, and clinicals. Student volunteers can record audio and video of the immediate impact of their project at their service site. Student interns can record presentations for their boss. Meanwhile, a student teacher can review the math lesson taped by her master teacher and improve or change the parts that didn't go as expected. If she wants, she can watch, re-watch, and carefully analyze exactly where things fell apart in the lesson. At the same time, a student nurse can improve his patient protocol after he watches how he did or did not hit the mark during interactions taped by his clinical partner. All of these real-world interactions can become part of instructors' tangible (vs. speculative) assessment of their professionals-in-training.

Next is *proportionate.* As we see it, mindful technology is more than simply knowing *how* to use technology. It is also about delving into the *when, where,* and *to-what-extent* questions that are sometimes out of sight or overlooked in our technology-saturated world. This mindfulness will call into question the constant or perfunctory use of technology, which is claimed by some to thwart young people's development of social and interpersonal skills, diminishing their mental and physical well-being.[3]

In determining when or when not to use technology, Tech and Trek will prompt students to explicitly consider cultural mores, privacy concerns, institutional (hospital, museum, theater) policies, personal health, and other factors that may be at play in the situation at hand. Furthermore, Tech and Trek will remind them that in many situations (foreign travel, restricted areas, etc.), failure to make the right decision can result in real-life consequences. All of this will help students determine when it might be better—more natural, more humane, more sensitive—to put the device down and keep their eyes, ears, and most importantly their hearts open.

The final "P" is *present.* To help us celebrate the rural, bucolic location of Hiram College, we will use our mobile program to capture and reflect on the sights, sounds, and textures of our environment and the various forms of life that flourish here. This special location lends itself to all kinds of high-impact learning experiences, including explorations of the natural environment and contemplations and commemorations of the people and events associated with the historic village that is part and parcel with our campus.

We are also planning for a campus-wide "no-tech trek time": an hour or so each week when all members of the community are encouraged to put their devices down and "be present" without technological interventions. During this time, many of us will lead hikes through the trails at the college's 550-acre Field Station or organize a walk along the 3-mile square around campus. This will also be a time when we can enjoy a cup of coffee while engaging in the highly personal and nonjudgmental conversations that build authentic relationships.

Conclusion

When a mobile technology program aims to teach students to be purposeful, pragmatic, proportionate, and present, it helps them avoid the pitfalls associated with technology use that is automatic, even "mindless." This focused and educationally purposeful use of technology is explicitly designed to ensure that students develop the 21st-century work skills sought by modern employers. In this way, the Tech and Trek program not only enhances Hiram's in-classroom and out-of-classroom learning but also prepares students to flourish personally and professionally throughout their lives. ■

Notes

1. Julie Evans, "Digital Content and Social Media: Views of Ohio's K–12 Students, Parents, Teachers, and Administrators," Ohio "Speaks Up" Series, April 11, 2013.
2. For more on the SAMR (Substitution, Augmentation, Modification, and Redefinition) model, see "SAMR and Bloom's," *Kathy Schrock's Guide to Everything* (website), accessed April 3, 2017.
3. See "Health and Technology," *Digital Responsibility* (website), accessed on April 3, 2017.

Lori Varlotta (varlottale@hiram.edu) is President of Hiram College.

ILLUSTRATION BY TOM REDFIRN, © 2017

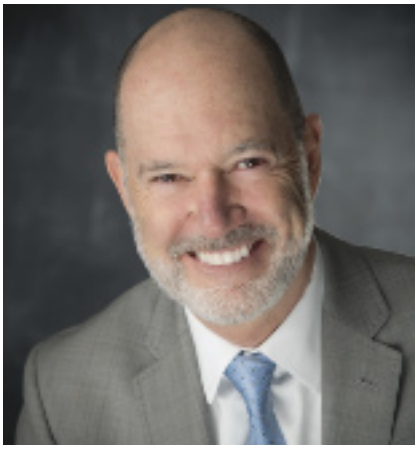
STUDENT SUCCESS MISSION CRITICAL

EDUCAUSE serves a tremendously wide range of colleges and universities, nearly 2,000 from 45 countries. Many sustain crucial and substantial research efforts, and some have created unique programs that are focused on the external communities they serve. Some are open-access institutions, and others are highly selective. Regardless of the mix, the teaching and learning enterprise is a basic element of their mission, and in turn, the success of our students is undeniably at the heart of the work of higher education. And even (or especially) when we are most preoccupied with our day-to-day activities, we can benefit from concentrating on *why* we are doing all this hard work. The reason, of course, is to help students define and meet their educational goals. As we strive to tackle the challenges of our daily work, we must also make sure this work advances the societal mission of all our institutions: educating students, a mission more critical than ever before—and more scrutinized by others.

To kick off our discussion of student success, we invited perspectives from colleagues at associations that represent leaders in various areas of higher education. We wanted to hear how *their* constituencies approach this core institutional issue. What does student success mean for their members? What major facets of student success are they trying to identify? What strategies are they prioritizing to address student success? From the perspective of their members, what role should technology play in the future of student success? If they could change one thing in the landscape for student success nationally, what might that be?

Below are three essays about student success from Kevin Kruger of Student Affairs Administrators in Higher Education (NASPA), Rebecca Martin of the National Association of System Heads (NASH), and George L. Mehaffy of the American Association of State Colleges and Universities (AASCU)—followed by thoughts from EDUCAUSE President and CEO John O'Brien.

The STUDENT SUCCESS Imperative



Kevin Kruger
President, Student Affairs Administrators in Higher Education (NASPA)

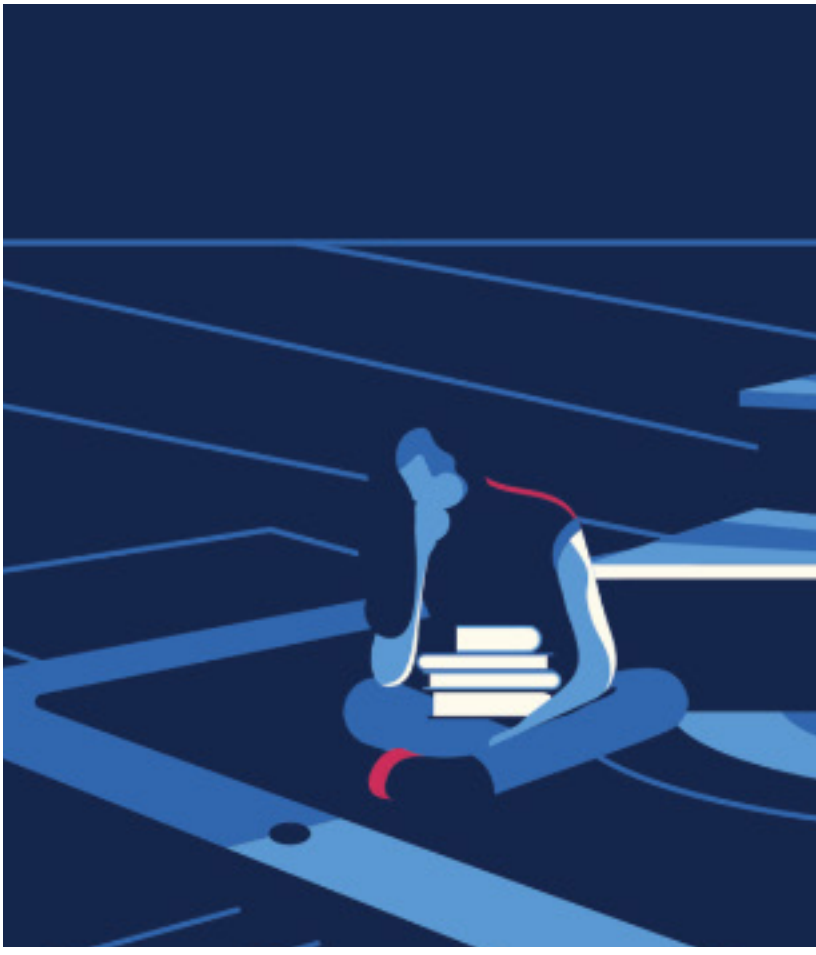
Title IX violations and sexual harassment on campus. Alcohol and substance abuse. Mental health issues and suicide. Student protests and controversial speakers. Threats to campus safety. Hazing and other acts of violence. These "headline news" items are the issues that too often define the work of student affairs professionals in higher education today. Most senior student affairs leaders would also say that the staff time and resources needed to address these issues have increased significantly over the last ten years.

The health, safety, and well-being of students have always been a primary focus of student affairs professionals. But with the rise in serious psychological issues among traditional-age college students, the increase in student activism by this current generation of students, and the growth in the enormous challenge of managing sexual assaults, the importance of this aspect of student affairs work has never been greater.

However, it is critical for us to understand that the role of the student affairs professional goes well beyond crisis and risk management. Central to our core mission is a focus on student success. What does student success mean for student affairs leaders? It means supporting the academic achievement and personal growth of every student. It means creating a campus ecosystem that recognizes that learning takes place not only through an engaging curriculum but also beyond the classroom, where students engage with each other and begin to develop the key competencies necessary to be successful in their chosen careers.

For students, success is about persisting toward a degree and, ultimately, graduation. Unfortunately, too many students who are enrolling in higher education institutions do not get to the finish line. Specifically, low-income students, first-generation students, and students of color complete college at significantly lower rates than their peers. This is a crushing blow to these students and their families, who often have accumulated debt through this process. And in an economy where by 2020, 65 percent of new jobs created will require a college education, these young people will find themselves outside the strongest opportunities for economic success.

Increasing persistence and completion for these students has thus become a primary focus of student affairs programs and services. We know that mentoring and coaching are important tools for improving degree progress for these students. We know that creating opportunities for involvement and engagement



in campus-based experiences pays great dividends for student success. And we know that outside of basic financial aid, small amounts of financial assistance can play a huge role in student success. Emergency aid programs, food pantries, completion grants, and other forms of assistance have been shown to increase degree persistence for students. In some ways, the modern student affairs professional must assume the role of social worker as the challenges facing low-income and first-generation students require much more individual support and coordination of services in order to guide them through degree completion.

We know that creating opportunities for involvement and engagement in campus-based experiences pays great dividends for student success.

However, given the constrained fiscal environment of most colleges and universities, where will we find the resources to support these newer student success strategies? This is where a strong partnership between student affairs leaders and campus chief information and technology officers is critical. As predictive analytics becomes more sophisticated, there is a tremendous opportunity to capture behavioral and engagement data in the campus data warehouse and to use that data both to identify students who may need greater support and to understand which experiences contribute to student success. For example, campus-card data can tell a complex story of how students use their time, where they go, and how they are engaged with the campus. New mobile-based applications can also identify where students are engaged and, based on this behavioral data, can nudge them toward academic support resources, new involvement opportunities, or career-related programs. All of this will require sophisticated data analysis and, more important, seamless connections to the campus student information system. Finally, with little resources for new staff to meet the increased demand for services, cloud-based and mobile applications and virtual self-serve technologies will become increasingly important in the student affairs world. Collaboration between student affairs and IT professionals around sourcing and selecting the most effective and integrated technology solutions will be critical.

The complexity of the challenges facing our campuses is very likely going to increase. The most recent election in the United States has heightened campus tensions around free speech, equity and diversity, immigration, and a whole host of other social justice issues. These will be key issues for student affairs professionals to manage. But in the midst of this, it will be equally important for us to sharpen our focus on student success and on degree completion for all students. Strong collaboration between student affairs, academic affairs, and IT leaders will be critical to the success of our students and also our institutions.

Collective Impact for STUDENT SUCCESS: Leveraging the Power of Systems

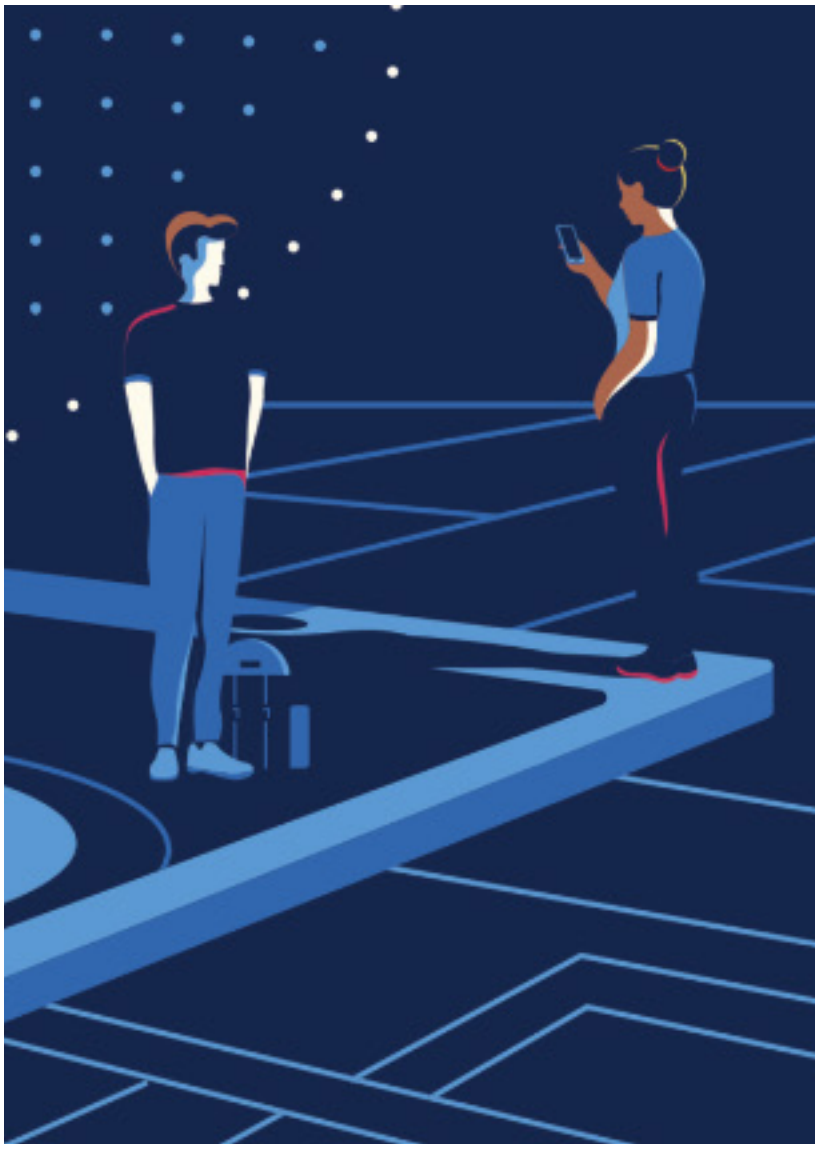
Rebecca Martin
Executive Director, National Association of System Heads (NASH)

Increasing college attainment and closing equity gaps are priorities across the United States, with widely recognized benefits for individuals, the economy, and civil society. Exemplars of student success have emerged across higher education institutions, systems, and states, but national completion rates continue to rise only slightly, and equity gaps continue to widen. Lessons and best practices developed in one institution are not being scaled across campuses and systems.

To address this need, in 2014 NASH launched the landmark initiative NASH TS^3 (Taking Student Success to Scale, http://ts3.nashonline.org/). Collectively, TS^3 is made up of 24 systems and over 300 institutions that span 18 states. These systems have a combined undergraduate enrollment of 2.9 million students, representing approximately 20 percent of all public undergraduate enrollments in the United States. In 2014–15, they awarded 578,000 undergraduate degrees and certificates. These systems also serve some of those students who are most in need. Among the 2.9 million undergraduate students, more than 1 million (35%) received Pell Grants. Additionally, nearly 800,000 (27%) undergraduate students identify as an underrepresented minority.

There are compelling examples of evidence-based student success interventions being taken to scale in NASH systems. It is time to move these pockets of success to the next level, accelerating and amplifying the interventions that work by leveraging the power of systems to support a sustained, large-scale effort. Utilizing a collective-impact approach, TS^3 focuses on three interventions, selected for their potential to make a significant change. Based on evidence of impact on persistence and completion for targeted student populations, these three interventions were identified as a starting point for a holistic and collective approach to redesigning our systems to support today's students. They were specifically chosen because of their demonstrated impact on underrepresented minority and low-income students:

- Redesigning the Math Pathway
- Guided Pathways Using Predictive Analytics
- High-Impact Practices for All Students



NASH members use the TS³ Network to support their work in any or all of these three interventions, which the TS³ leadership view as tightly related. Each of these interventions is being scaled up in at least one NASH system—with demonstrated improvement for all students, as well as impact on closing equity gaps for underrepresented minority and low-income students. Leaders from systems on the cutting edge of these interventions are guiding the work. Scaled across the 24 TS³ systems, these interventions will generate an impact greater than the sum of their parts. Ultimately, the goal will be to implement all interventions across all campuses in each of the participating systems, with long-term sustainability at the core.

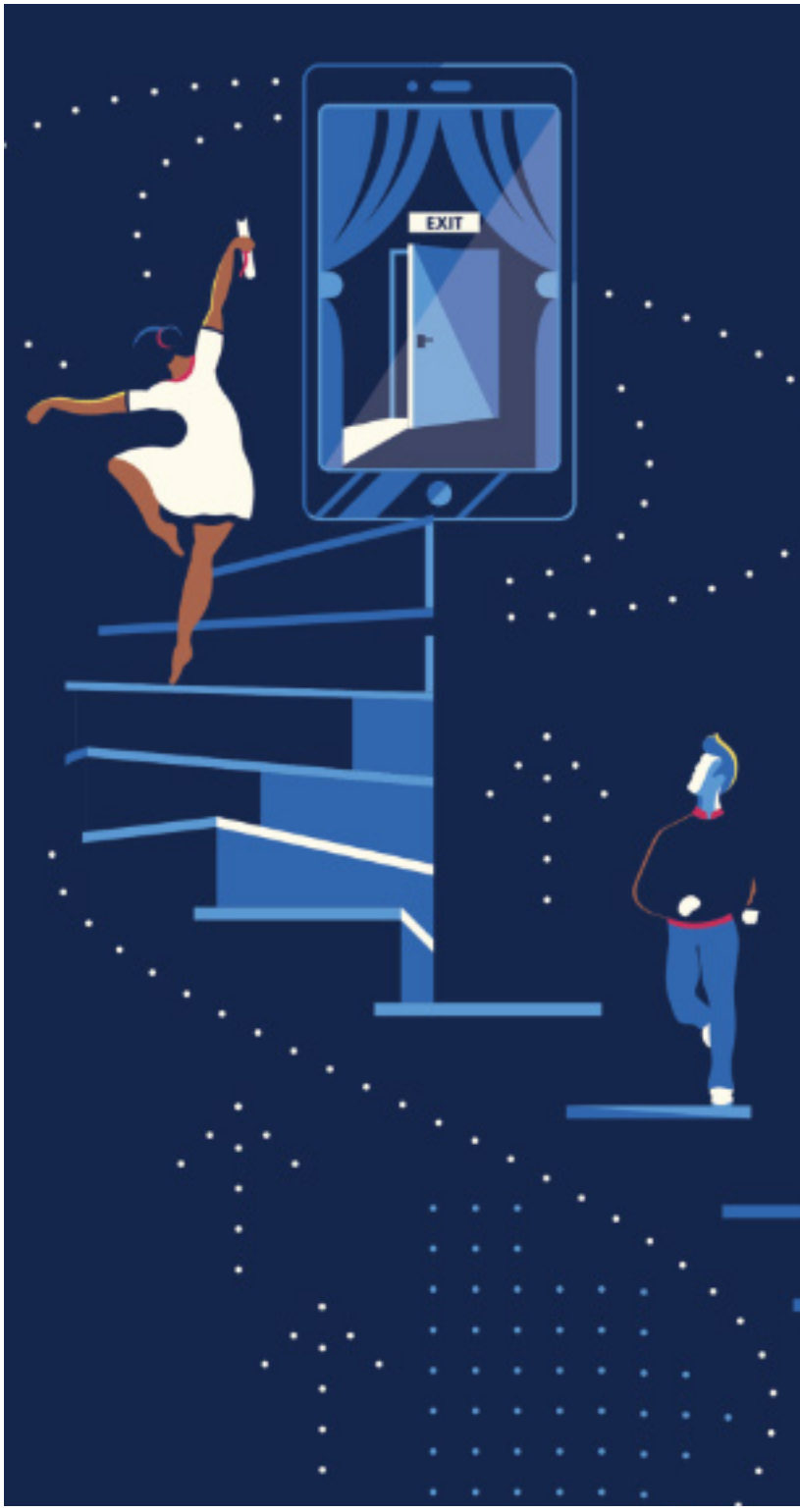
Technology plays a key role in all of this work. Offering advanced advising services and tracking the progress of individual students require sophisticated systems that make data available to end users in secure yet easily accessible ways. Building high-impact practices into degree requirements necessitates new approaches to transcripts and student record systems. Monitoring progress on multiple dimensions of student success relies on well-developed data management systems that provide the right data to the right people at the right time. Technology leaders often hold the keys to these solutions and to others that promote student success.

It is time to move these pockets of success to the next level, accelerating and amplifying the interventions that work by leveraging the power of systems to support a sustained, large-scale effort.

NASH is working to bring about a key change in the higher education landscape: taking what we know works and getting it to all of our students. The evidence shows that these interventions can make a difference in student retention and completion. Our challenge now is to scale these best practices to reach every student in our public institutions.

STUDENT SUCCESS: Seven Things Not to Do

George L. Mehaffy
Vice-President for Academic Leadership and Change, American Association of State Colleges and Universities (AASCU)



The current focus on student success represents a major shift from an earlier focus on access. We now realize that it is not enough to get students into college; we also need to graduate them. So today, higher education institutions, states, the federal government, and foundations are all much more focused on completion and student success than they are on access. It's not hard to figure out why the shift has occurred. Students and their families are taking on increasing amounts of debt, states and the federal government are concerned about their investment in loans and grants, and institutions are concerned both about the success of their students and, increasingly, about their own financial viability, which is inevitably linked to retention and graduation.

Not surprisingly, a great deal of effort and enormous resources are being devoted to figuring out the appropriate strategies, policies, and practices that can make a difference in increasing student success. Everyone is looking for the secret sauce. The exciting part about this work is that there is cause for substantial optimism about increasing student success, particularly for low-income students, first-generation students, and students of color. We have seen, in some settings, specific strategies that make a significant difference.

At the same time, I watch with some concern as campuses search for solutions. The transfer of a practice that is successful in one environment into a new environment does not always turn out well. Some kinds of reform efforts, though

well-meaning, are doomed to failure from the outset. In fact, the landscape of innovation in higher education is littered with examples of good intentions gone awry, promising practices somehow subverted. One way to think about an agenda of transformation might be to begin first with what to avoid. From our work on several projects involving student success, I've built a list of seven things one should *not* do.

1. *Fix only one thing.* Everybody is searching for the magic bullet, and sometimes there is a tendency to think that one strategy is the solution. My sense is that the campus is an ecosystem, and changing one part requires changing other parts too.
2. *Assume one-size-fits-all.* When we see a successful strategy used somewhere else, we immediately think that if we did the same, we might get the same results. But even institutions that appear to be quite similar can in fact be very dissimilar, in terms of history and circumstance.
3. *Ignore culture.* Peter Drucker's famous saying is as true in higher education as it is in business: "culture eats strategy for breakfast." The culture of the campus—particularly whether faculty and staff believe that they are partly responsible for student success—shapes outcomes in dramatic ways.
4. *Avoid the academic heart of the enterprise.* Many of the transformation efforts that I see focus on things at the margins rather than at the center. I see changes in institutional strategies and changes in student support areas. But the core of the enterprise is the curriculum and particularly the classroom. Some people avoid tackling that area because it is likely the most difficult. However, substantive change in student success outcomes must include attention to what happens to students in classrooms and in their academic journeys.
5. *Overlook implementation issues.* Innovation requires careful consideration of who is affected—that is, whose ox is gored—by the implementation of a new program or strategy. Unless there is careful attention to implementation issues, an innovative strategy is likely to be stillborn.
6. *Downplay the experience of students.* Far too often, we have seen the development of great programs that seem to be ideal. Yet the programs fail because they don't understand the student experience.
7. *Insist on a top-down initiative.* Most successful initiatives on campuses require, in my experience, strong support by both faculty/staff and senior administrators.

So what would I do to increase student success? The core concept in the AASCU project Re-Imagining the First Year of College assumes that real transformation requires multiple, scaled innovations. Several innovations are very promising. First, student belonging and growth mindset issues must be considered when thinking about success for low-income students, first-generation students, and students of color. Predictive analytics, connected to an intrusive advising system, has shown substantial promise, particularly for earlier intervention. Summer bridge programs are an effective way to matriculate underprepared students. Academic co-requisite courses paired with developmental education courses have shown enormous success, particularly in the Tennessee Board of Regents work. The work around pathways, with clear degree maps and with reduced choice, helps students navigate in a complex environment. Moving from accepting only one course (e.g., college algebra) for a mathematics requirement to allowing three alternatives would significantly increase student pass rates. Course redesign—including careful review of gateway courses, the addition of high-impact practices, and the creation of interdisciplinary courses of high interest—would engage students more in their academic work. An early career focus and the use of meta-majors help students who are trying to decide their future. Financial counseling, financial literacy, and emergency grants and loans for juniors and seniors in good standing are all financial strategies that contribute to student success.

But for a comprehensive approach to student success, the heart of the matter is what happens in classrooms. We need new and better ways to engage faculty in thinking about student success. We need new professional development strategies that are faculty led and that build communities of practice around successful pedagogy. We need new incentives to reward faculty who work to help all students succeed. For student success to be successful, we must spend a substantial amount of time paying attention to the area that is least attended to in our current student success work: what happens in classrooms.

Finally, in all of our work toward student success, we must not forget the power of culture. The best programs, ideas, and strategies will die if placed in the hostile environment of an unsupportive culture, much like throwing seeds onto a piece of granite and expecting them to sprout. Talking about student success, celebrating effective practices, challenging sometimes unstated beliefs, and recognizing individuals who are contributors to student success are all ways that an institution can build a culture that encourages and promotes student success.

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STUDENT SUCCESS

A Vital LINCHPIN

John O'Brien

One of the most important evolutionary changes in higher education recently has been the broad recognition that access is not enough. Most educators today understand that the goal line has moved from helping students gain entry to college to helping them succeed once they have enrolled. That fundamental reorientation in focus is profound. It means that our hardest work needs to involve finding the strategies and tactics that will best enable students to meet their educational goals, whether they are pursuing a degree or striving toward some other educational objective.

Within that context, it has been gratifying to watch the topic of student success ascend as a key issue on the EDUCAUSE annual list of top 10 IT issues. Although this issue did not even appear on the list until 2013, it ranked in the top 4 through 2017.[1] Analyzing the top issues that emerged as members' priorities for 2017, EDUCAUSE Vice President Susan Grajek and the 2016–2017 EDUCAUSE IT Issues Panel came to a compelling and insightful conclusion. Even though the theme of student success was not the #1 issue, a critical mass of the top 10 issues themselves are, in fact, "all about student success." The authors concluded that the 2017 top 10 IT issues list supports higher education's focus on student success through four key themes: IT foundations, data foundations, effective leadership, and successful students. Further, interviews with panel members about the annual top 10 list corroborated that "the summative motivation for addressing today's digital challenges is student success and, accordingly, institutional success." The authors wrote: "IT leaders realize that the success and potentially the future of their institutions rest on the success of their students and that digital technology is an essential foundation for both institutional and student success."[2]

Without a doubt, we have been building toward the convergence of student success and information technology for several years. But I think the student success focus of the 2017 top 10 IT issues list has two additional, even deeper implications. First, it reflects a critical pivot in our orientation—from think-

ing narrowly about the IT ramifications of student success (e.g., "What emerging, captivating technology might help students succeed?") to conducting a much broader exploration (e.g., "What role can and should information technology play in helping the institution advance its student success mission, and how can the IT organization contribute strategically to help accomplish that goal?"). Looking at this challenge through that larger lens suggests that our thinking about the nexus between information technology and student success has matured and deepened. Second, the student success focus embodies a new level of interest—and perhaps even a new degree of urgency—around the need for institutional leadership to call for all stakeholders, from disparate areas and roles (including students and faculty), to transcend silos and collaborate to achieve this goal.

The Promise of Technology-Enabled Advising

Meeting the challenges of this difficult work will require both nuanced and transformational change at higher education institutions, which in turn will require transformational strategies and tools. To that end, EDUCAUSE is deeply committed to the potential of technology-enabled advising[3] as a framework for a campus-wide commitment to student success. With support from the Bill & Melinda Gates Foundation and the Leona M. and Harry B. Helmsley Charitable Trust, EDUCAUSE is leading efforts to explore the promise of integrated planning and advising systems to move the difficult-to-move needle of student success. With a major grant challenge, we are providing three years (through 2018) of financial and technical support to twenty-six institutions that have been selected to design and implement projects that use predictive analytics to improve degree planning, student advising and counseling, and the targeting of and intervening with students at risk, honing institutional support and services to improve student success. In addition, ten "community member" institutions are collaborating with the grantees. Together, the thirty-six colleges and universities constitute a network of student success leaders who are sharing practices, learning new approaches, and enhancing their student services.

One overarching theme in the grantees' work is that they are essentially applying design thinking to the development of systems that can best serve students—thinking that is intentionally informed by the perspective of the students themselves. Another impressive dimension is a focus on sustainability through understanding the return on investment of the advising redesign projects. Initial results indicate that institutions are making investments in ongoing resources that will ensure they have the ability to support the initiatives beyond the term of the grant.[4]

More broadly, the grantees are nurturing change leadership and helping their institutions develop a capacity for cross-campus transformation focused on student success. In other words, the grantees are investing in holistic, institution-wide change, not merely incremental improvements.[5] Now halfway through their projects, the grantees are working to inculcate across campus the sense that student success is everyone's responsibility. Finding and developing productive strategies and practices for working across functional silos and engaging disparate campus offices and stakeholders in pursuit of the same goals can be challenging indeed. Ana Borray, director of iPASS implementation services at EDUCAUSE, characterizes the work at this stage by noting that virtually all the grantees are "in a learning phase to determine how best to bring this all together."

We applaud the grantees' hard work. Effecting this kind of transformational change is essential if we expect to improve student success more than just incrementally.

Alignment across the Campus

The contributions above from our colleagues at NASPA, NASH, and AASCU underscore the significance of engaging campus leaders in an institution's student success efforts. We'll never get the traction we need unless leaders across an institution create common goals and are committed to working together to meet those goals. One positive step in this direction is the growing number of new cabinet-level positions whose core focus is student success. With titles such as vice president for student success or vice president for degree completion, these leaders emphasize the importance of student

success as a strategic focus for their institutions.

Of course, CIOs also need to engage and collaborate actively in institutional efforts to improve student success. The most effective CIOs understand how their work contributes to institutional goals and must deliver on those responsibilities accordingly. In that sense, campus initiatives around student success create unique opportunities for CIOs and their staff to be part of institutional change leadership. Because technology is such an integral part of student success strategies, for example, this work allows IT experts to help break down campus silos and create new methods for true cross-campus collaboration. In the age of "BYO" everything, even for critical IT systems, this work is an opportunity to elevate the IT organization's core capabilities in procurement, contracting, and negotiation and in the successful definition and management of high-stakes projects.

Campus initiatives around student success create unique opportunities for CIOs and their staff to be part of institutional change leadership.

Finally, we also must do more to engage faculty in our student success goals. Some of what we've learned about technology-enabled advising implementation suggests that faculty are among the least-involved stakeholders, along with students. This is particularly ironic because these systems are designed to support students, and research shows that faculty buy-in is critical.[6] If systems for student success are going to succeed, and if we expect faculty to use these systems, we need to include faculty in their planning and deployment. Similarly, we need to make sure that these efforts reflect the perspectives of their ultimate beneficiary, the student.

Promising Evidence of Change

We are seeing promising evidence that substantive change may be taking hold. The EDUCAUSE technology-enabled advising work, for example, shows that campus leaders are looking for ways to work together productively to advance their institutional goals for student success. From the president on down, they are deeply focused in their commitment to student success. Institutions are addressing the complexities of integrating different technological solutions. They are innovating to better meet students' needs, for example through stackable credentials and pathway models—approaches that can occur only through the collaboration of multiple campus stakeholders. Similarly, institutions are discerning how best to apply technology to pedagogy in the support of student success. Finally, individual institutions are documenting improved student success as a result of change strategies.[7]

Of course, we are not yet where we need to be. Student completion rates are still too low. Campus systems and processes are still not adequately aligned in support of student success. Although technology solutions and analytics in support of student success are evolving rapidly, efforts are often still too fragmented, presenting significant integration challenges at the back end and preventing a unified student experience. The organizational barriers inherent in our siloed campuses still impede progress. However, if colleges and universities increasingly take a strategic view of student success, and if their leaders deliberately work to engage collaboratively in establishing a shared vision and goals for student success, those fundamental requisites for progress will bear fruit.

Without a doubt, improving student success is extraordinarily hard work. I strongly believe that solutions such as those embodied in the technology-enabled advising work supported by EDUCAUSE represent some of the most promising tools for finding traction when it comes to this most intractable challenge. Student success is a vital linchpin: if students don't succeed, colleges and universities don't succeed. Our full attention must be concentrated on the mission-critical goal of helping students define—and meet—their educational goals. ■

Notes

1. See "Top 10 IT Issues: 2000–2017," an interactive graphic that tracks the rankings of the top 10 IT issues over the years: http://library.educause.edu/~/media/interactive-content/2017-it-issues-trends/index.html.
2. Susan Grajek and the 2016–2017 EDUCAUSE IT Issues Panel, "Top 10 IT Issues, 2017: Foundations for Student Success," *EDUCAUSE Review* 52, no. 1 (January/February 2017).
3. See "Technology-Enabled Advising," Bill & Melinda Gates Foundation, Postsecondary Success (website), accessed March 22, 2017.
4. Donna Desrochers and Rick Staisloff, "Creating Sustainable Innovation with iPASS," *EDUCAUSE Review*, March 8, 2017.
5. See EDUCAUSE Learning Initiative, "7 Things You Should Know About Change Management," October 12, 2016.
6. D. Christopher Brooks, *IPAS Implementation Handbook*, research report (Louisville, CO: EDUCAUSE Center for Analysis and Research, October 2014); Ronald Yanosky, *Integrated Planning and Advising Services: A Benchmarking Study*, research report (Louisville, CO: EDUCAUSE Center for Analysis and Research, March 2014); Hoori S. Kalamkarian and Melinda Mechur Karp, "Student Attitudes toward Technology-Mediated Advising Systems," CCRC Working Paper No. 82, Community College Research Center, Teachers College, Columbia University, August 2015.
7. See Ana Borray and Nancy Millichap, "Can Making College Completion Paths More Personalized Increase Student Success?," *EDUCAUSE Review*, March 3, 3017.

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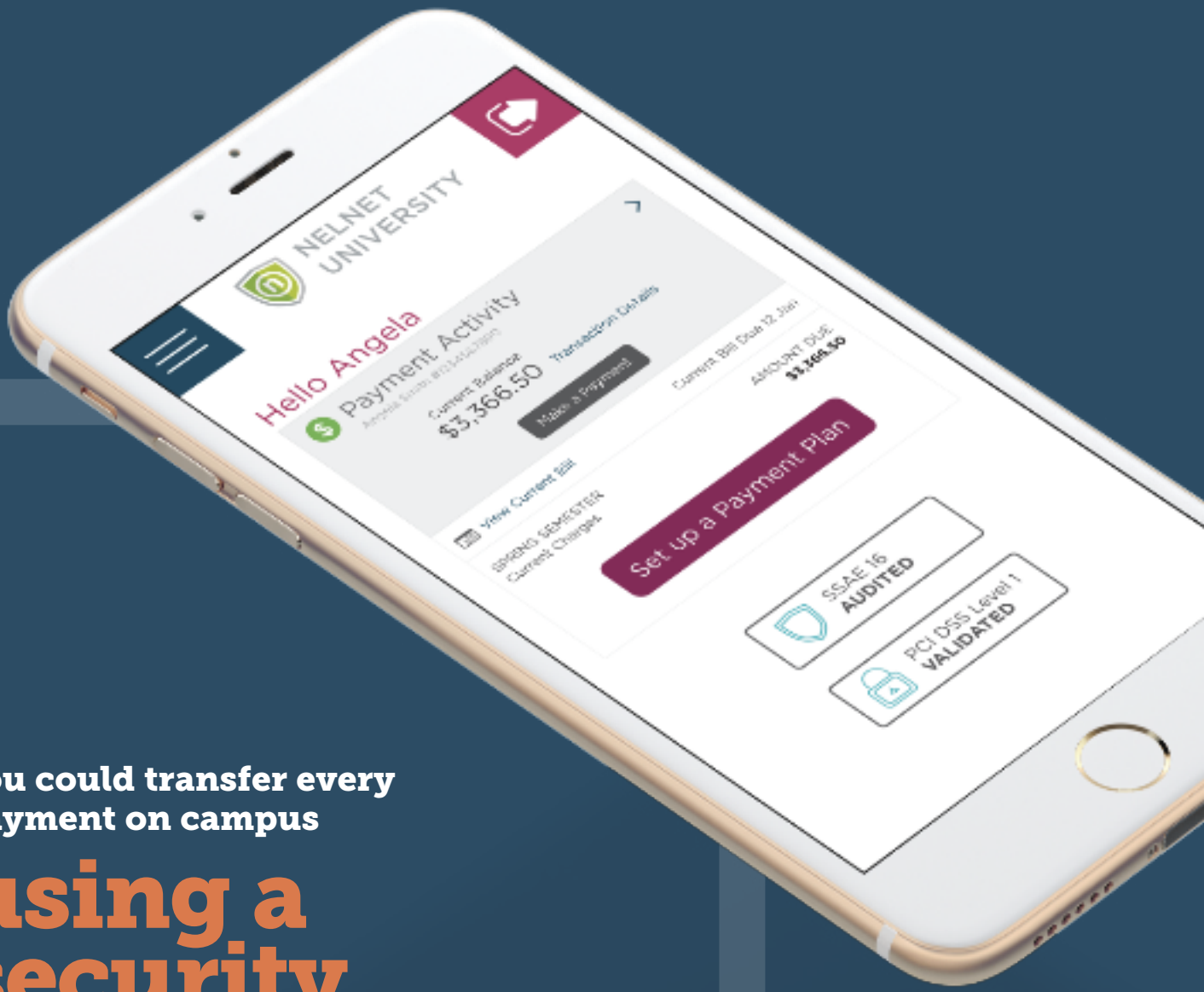

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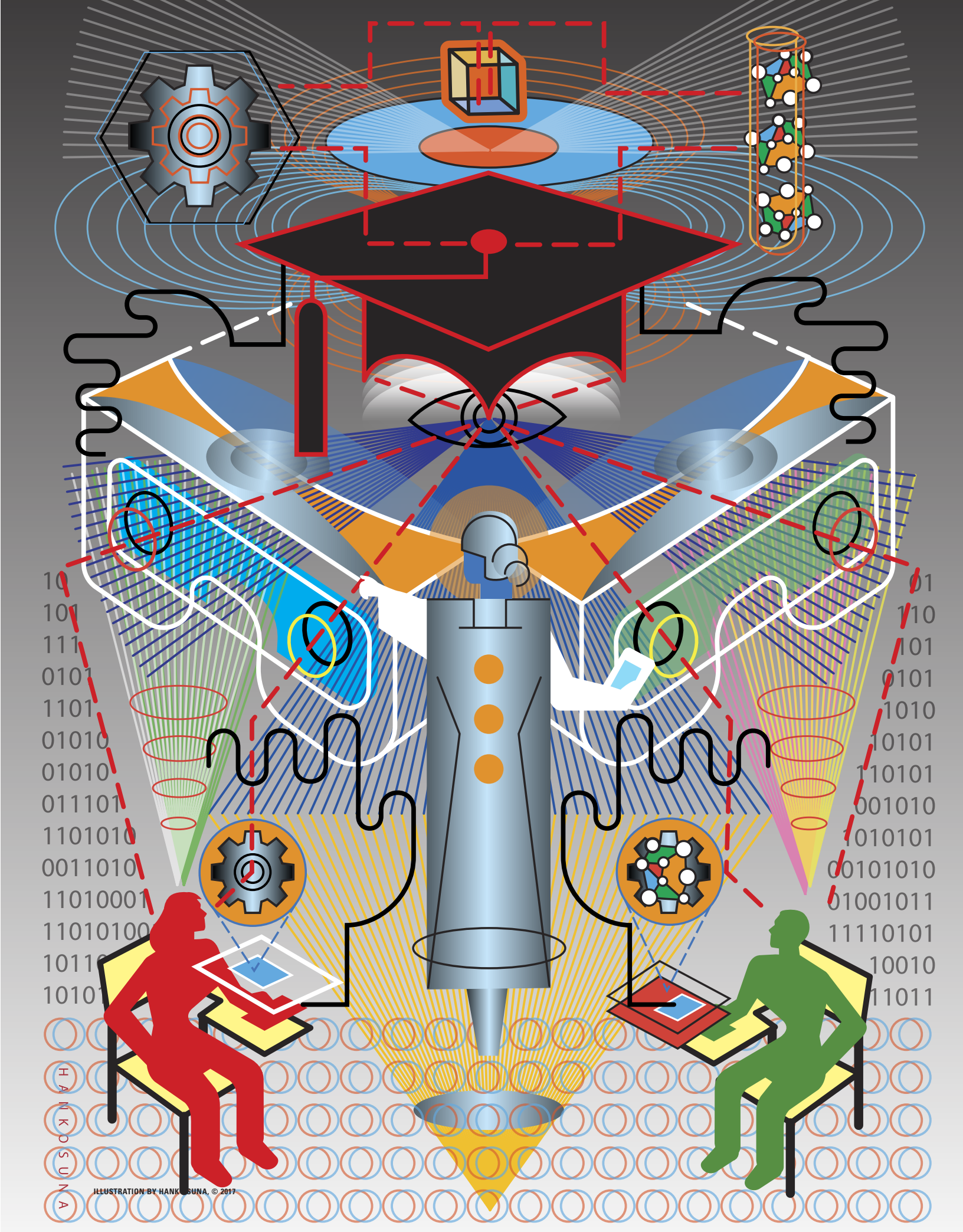
Student Success, Venture Capital, and a Diverse Workforce

An Interview with Heather Hiles

In October 2016, the Bill & Melinda Gates Foundation named Heather Hiles as its new Deputy Director for Postsecondary Success. Prior to joining the Gates Foundation, Hiles was founder and CEO of Pathbrite, which offers digital portfolio services to educational institutions. Before founding Pathbrite, Hiles had built a solid career spanning more than twenty years in education, workforce development, and finance. A successful serial entrepreneur, she held leadership positions in several private- and public-sector organizations, including serving as Commissioner for the San Francisco Unified School District, Executive Director of Silicon Valley Social Venture Fund (SV2), cofounder of EARN, and CEO of SFWorks, a nonprofit that transitions women from welfare into careers. Hiles received her B.A. from the University of California at Berkeley in Economic Development and Ethnic Studies and holds an MBA from Yale University, with a concentration in Finance and Strategic Planning. She currently serves on the board of UNIFORM (a woman-owned cooperative based in Liberia) and has served on the boards of Leadership Public Schools, Alonzo King Lines Ballet, AIDS Legal Referral Panel, and Communities United Against Violence (CUAV).

Recently, EDUCAUSE President and CEO John O'Brien had a chance to talk with Hiles about a number of topics, including her experience as an entrepreneur, her current work with the Bill & Melinda Gates Foundation, and her aspirations for the future.



JOHN O'BRIEN: By way of introduction, what would you most like the EDUCAUSE community to know about you and your background?

HEATHER HILES: That I have about twenty-five years of experience in both education and workforce development. I bring to my job at the Gates Foundation a real appreciation for what the education community is doing to serve our community members, our population.

I am aware of—and getting excited to learn even more about—the challenges to making sure colleges and universities are truly prepared and resourced to serve the students that we want so desperately to succeed, especially those who face a wide range of hurdles getting into and through college: low-income and first-generation students, students of color, and working adults.

Our vision at the Gates Foundation is a higher education system that propels social mobility and economic development. And our goal is to ensure more students complete the training and education after high school that will prepare them to support themselves and achieve their dreams.

O'BRIEN: Your background includes life in the venture capital world. Do you have ideas about how some of those approaches might enter into your leadership and your work at the Gates Foundation?

HILES: I think I have realistic expectations for how to associate the level of risk and support different stages of companies are facing and require.

I have the experience of having created a student-centric product and then raising venture capital and other investment money to build my platform. From the creation to raising the first capital and all the way to selling the company, I know what it is like to serve this market, one of the most challenging markets to be involved in. I think it's helpful to have an understanding of what it's like to run a company as well as what it's like to be an investor in the space.

My experience of imagining and building the first cloud-based, mobile, digital portfolio platform with approximately 5 million postsecondary users has given me a real appreciation for the value of and difficulties in offering student-centric technologies and for how they can benefit us in our mission to help students succeed. The perspective I gained as an entrepreneur has helped me understand the power of technology—for example, how mobile applications, machine learning and artificial intelligence, and predictive analytics and big data can serve our students and also support our efforts to help them be more successful.

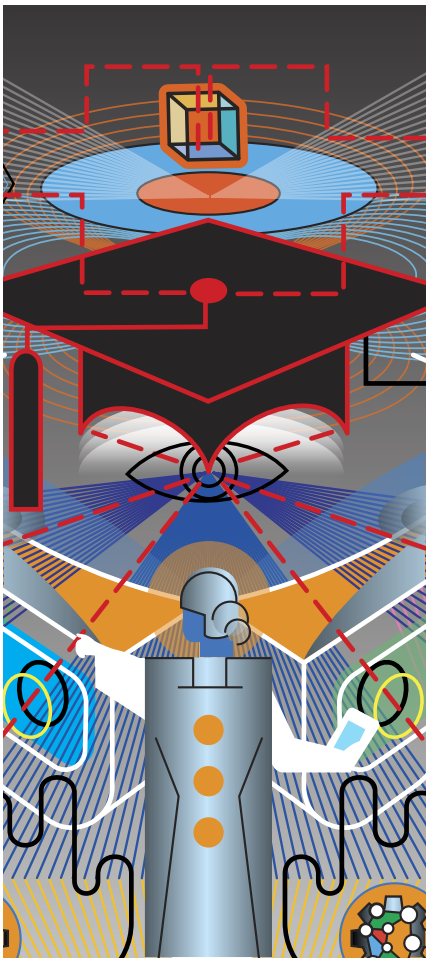
There are so many wonderful examples of education technology, and then there are so many incredible ways in which these technologies have been applied—and perhaps could be applied in the future—to educational challenges. For example, 3D technology has been a fantastic advancement in helping people develop courseware that allows students to have very realistic experiences. We want to help ensure smart technologies are applied in affordable ways and in ways that are scalable and accessible to students, to faculty, and to administrators.

What is great about the Gates Foundation is that we have access to grant money as well as program-related investments. This allows us to seed new ideas, share lessons learned, and bring new partners to the table, so we have different ways of making an impact and investing in important technologies and practices to benefit students.

O'BRIEN: What are your first impressions of the EDUCAUSE community?

HILES: Actually, I've been talking to the EDUCAUSE community for a number of years. With Pathbrite, I twice had the opportunity be a part of the EDUCAUSE Annual Conference Start-Up Alley, the demonstration space for innovative products and services from emerging edtech companies. That was a tremendous experience for me, as an entrepreneur. Then at the 2014 EDUCAUSE Annual Conference, I presented at the Learning Theater, in a session hosted by the Gates Foundation.

My impression of the EDUCAUSE community is that you have a fantastic reach—to all levels of faculty and administrators—and a wonderful breadth in the types of institutions in your membership. You also create opportunities for engagement in multiple types of venues that are effective for different levels of communication and offer various depths of content. I'm excited to continue working with EDUCAUSE, even though it's now in a different capacity, as a partner and supporter of EDUCAUSE.



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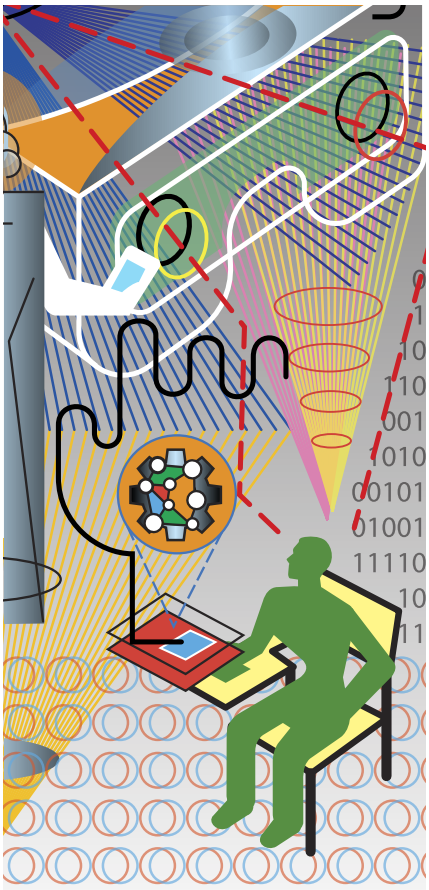

O'BRIEN: Thanks, Heather. From your perspective, what are some of the most notable successes resulting from the Gates Foundation's investments in higher education so far?

HILES: There really are too many for me to enumerate here. But high on my list would be the Gates Foundation's commitment to and investment in helping higher education institutions figure out what is needed to further students' success—a commitment that has taken so many different shapes and formats in the solutions work that I'm continuing to advance. We're identifying and holding up best practices, as well as best technologies, for various administrators to see. For example, if community college leaders see an example of what another community college has achieved—perhaps good digital learning solutions—they can learn from the successes of those institutions, which are similar to the ones they are running.

There is so much deep, good investment in this area. It's exciting to jump in and try to do more. We see excellent best practices for pathways, advising, developmental education, digital learning, emergency aid, financial security, and work-study solutions. The ongoing sharing and dissemination of that information with other postsecondary institutions is very important.

O'BRIEN: When you talk, as you just did, about sharing, is that a reflection of the Gates Foundation's unrelenting focus on scalability?

HILES: Yes. There are many organizations, like EDUCAUSE, that are convening educational institutions, nationally and internationally. If we can help advance solid research and provide a platform for institutions to share their best practices and technologies that work, and if EDUCAUSE and other organizations can cascade that information throughout their hundreds and thousands of institutions, we can get closer to our goal of scaling what works.

In addition to supporting innovative solutions that help students get on a path to a certificate or degree after high school—and stay on it through graduation—the Gates Foundation supports networks of institutions that share best practices so others can benefit from lessons learned and transform their own policies and practices to meet the needs of students.

O'BRIEN: What are your aspirations for your future at the Gates Foundation?

HILES: Some of my aspirations include helping to crack the code on how to provide scaled technologies that can be used by various institutions and many different types of students. We haven't yet figured out how to support institutions and students to access and make optimal use of technologies. And I think that's a challenge for the whole postsecondary success team.

I have personally taken on the challenge of trying to make sure we provide as much information, technical assistance, and resources to public institutions as possible, so they can afford to serve all local students who want to access their offerings.

At the Gates Foundation, we have a lot of information about what it means to provide an affordable education and what it takes to help students succeed, as efficiently as possible, in completing their programs. It's important that we make sure the postsecondary educational and training offerings for students are well-aligned with the knowledge economy that is becoming, basically, our total economy. We need to make sure we are preparing our students to be lifelong learners and succeed in an ever-changing workforce.

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on track to have 11 million fewer people than our economy will require by 2025—11 million people without the needed certificates and degrees.

O'BRIEN: I'm guessing that's what keeps you up at night—the size and scope and sense of urgency around that mission?

HILES: Absolutely, that's correct.

O'BRIEN: I know that you, as a leader and especially as a newly appointed leader, love all your children equally. But off the top of your head, are there specific upcoming projects that have captured your imagination and that you'd like to mention here?

HILES: Yes, I do love them all equally! But right now I'm having fun getting much more directly involved with our technology-enabled advising work. I'm excited about continuing to knit together the different solutions that we've been investing in—for example, financial aid and financial advising combined with traditional course-related and program-related advising, which go hand-in-glove. The next stage of our work is about interweaving these solutions and helping institutions see how to integrate the different practices and technologies that show promise and early results.

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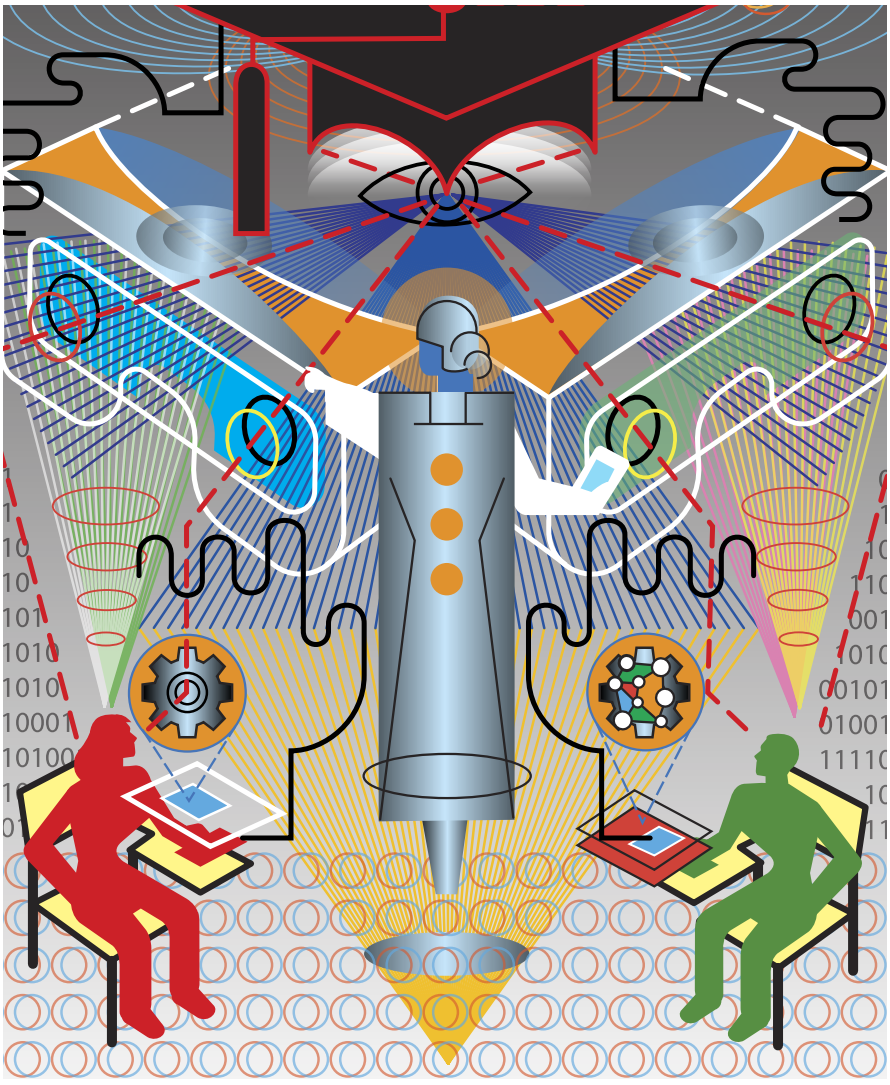

So that is where a lot of my attention is going. But we are also collaborating with many grantees and partners who are on the ground level, working directly with institutions to enhance the level of coaching and advising about financial and emergency aid and related services.

I love all of that, and I love bringing it all together. I'm also excited about the work we're doing right now with return-on-investment studies of different practices, starting with digital learning solutions and moving to advising and remedial education. This will allow us to identify very specific best practices for different kinds of institutions.

O'BRIEN: The Gates Foundation, with its belief that "all lives have equal value," offers a powerful idealism. I love the title of its blog: *Impatient Optimists*. Which are you? Are you impatient or are you optimistic about higher education work?

HILES: Oh, that's easy to answer. It's not an either/or question. It's both. Yes, I am impatient, although over the years I've tried to manage that. I have a burning sense of urgency related to this work as I see people all around me struggling to survive and thrive. It's with me every

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waking hour, frankly. We have so many people who have been disenfranchised, who are not part of a productive economy but want to be. I have a real desire to serve those people, to get them to a place where they can be productive, and feel engaged, and contribute to society. I'm also incredibly optimistic. I couldn't do this work if I didn't believe in people and in the value of providing opportunity to all people. It's what I've dedicated my whole life to—my whole working life and a lot of my free time as well.

O'BRIEN: I hear the impatience. I hear a little bit of joy as well. Is that also part of the profile?

HILES: Yes, that's correct. When I was in my twenties, I worked with high school students who had to have jobs just to stay in high school. In the 1990s, I worked with employers to build training programs that would get people from welfare into living-wage careers. I served as a commissioner for the San Francisco Unified School Board and on the board of a set of charter high schools (for eight years). I've worked with college students most recently. I really do derive joy from helping people realize their dreams.

O'BRIEN: What about other interests?

HILES: I'm very passionate about virtual reality and augmented reality technologies. I've done a lot of research into the state-of-the-art and the potential with VR and AR.

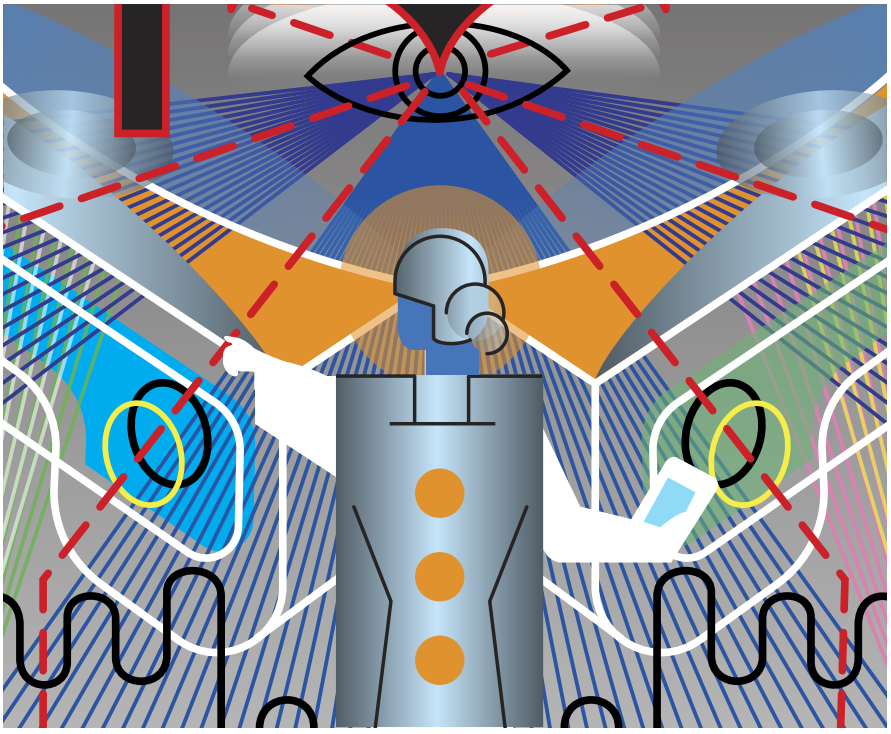
I want to help managers who have been comfortable working with one type of employee but don't have the strengths or the experience of working with a diverse workforce.

O'BRIEN: Me too. I've been talking and speaking for the last decade about how technology can produce this amazing engagement with students, and I feel like right now it's actually all finally happening. Instead of games and simulations with pulldown menus, we can fully and literally immerse ourselves. I'm watching with great interest and enthusiasm. This leads to my last question: If you weren't in your current position, what would you be doing?

HILES: That's a tough question. After selling my company, Pathbrite, in October 2015 I took time off for almost a year, because most entrepreneurs will tell you that starting up a company takes years off one's life, so you need (if possible) to put back into the bank what you withdrew. I tried to relax.

Instead, I started writing a book about how to retain a diverse workforce—a project that I continue to spend time on. When I say *diverse*, I mean in all manners: not only race/ethnicity, gender, and age but also disciplines and perspectives. I'm very passionate about how to manage people in a way that helps them actualize themselves, helps them feel rewarded by and wonderful within their jobs. I want to help managers who have been comfortable working with one type of employee but don't have the strengths or the experience of working with a diverse workforce. I thrive personally by working with and managing teams of diverse talent. My book writing is going slower than I would like, but this is the one thing I would do.

Right now, I'm focused on working with our partners to ensure more students graduate and we move toward closing attainment gaps. ■



Disclosure: The EDUCAUSE technology-enabled advising initiative (i.e., iPASS) is supported by funding from the Bill & Melinda Gates Foundation.

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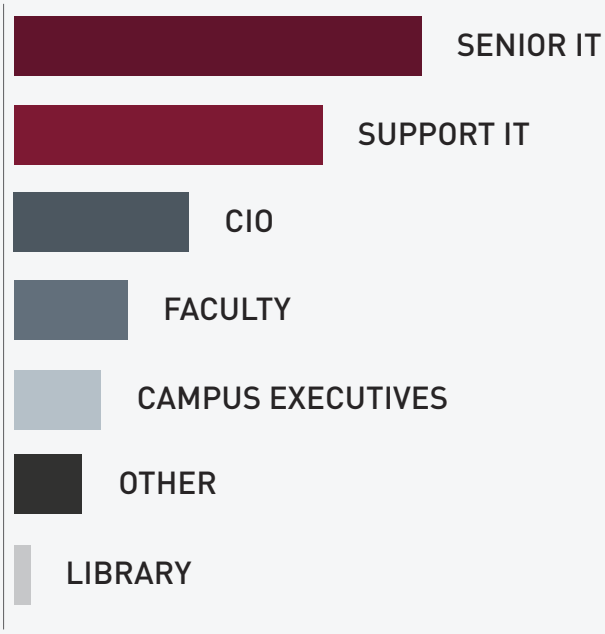

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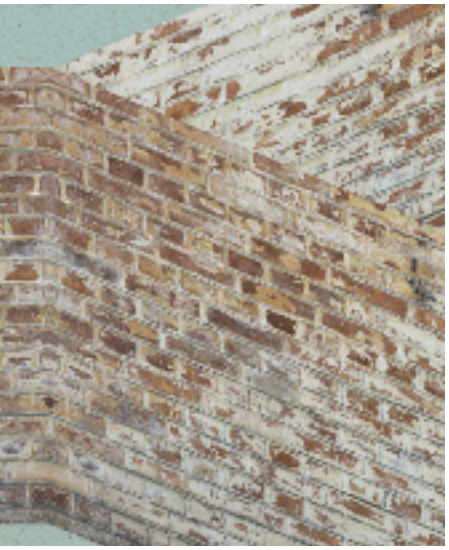
COMMUNITY COLLEGES AND STUDENT SUCCESS: Models for Comprehensive Reform

Thomas Bailey

Over the last few decades, the importance of a college education has grown both for society and for individuals. This is reflected in the large earnings gap between individuals with a high school degree and those with a postsecondary credential. However, most students who start in community colleges never complete a degree or certificate. This constitutes a failure for those students to achieve their goals and represents a loss of potential earning power and economic growth and activity for the economy as a whole. Although students experience earnings gains by accumulating credits without graduating, they get a significant additional increase upon completing a credential.[1]

The Growing Focus on College Completion

Public higher education policy in the latter half of the 20th century was designed to open college to the large majority of the U.S. population. The Servicemen's Readjustment Act of 1944 (also known as the GI Bill), the California Master Plan for Higher Education of 1960, the Higher Education Act of 1965 (which established the Pell Grant), and the rapid growth of community colleges were all designed to make college accessible for all students.



Community college students tend to face many serious barriers to success: low-income students are significantly overrepresented in community colleges, and most need to strengthen both academic and nonacademic skills.

They focused on reducing the cost of college to the student and, in the case of community colleges, established open-access, flexible, convenient colleges in reasonable proximity to a large majority of the population, especially including groups traditionally underrepresented in postsecondary education. At the same time, technology and the characteristics of work were also changing, resulting in increasing demand for a more educated workforce. These factors contributed to increases in college enrollment, such that by the turn of the century, over 75 percent of high school graduates had attended some postsecondary institution by their mid-twenties.[2]

But over the last twenty years, educators and policy makers have turned their attention to college completion. While progress on enrollment cast community college performance in a positive light, the more recent focus on completion yields a much more negative image. In 2000, the Department of Education began publishing three-year graduation rates for most colleges that tracked cohorts of first-time, full-time students who started in community college. Graduation rates for many colleges were in the single digits and teens. The overall three-year completion rate for community college students nationwide was 24 percent for the 2000 cohort and 20 percent for the 2010 cohort.[3] Researchers, college representatives, and policy makers have criticized this rate as incomplete and misleading.[4] But more comprehensive measures from the 1990s showed that less than 40 percent of entering community college students completed any degree or certificate from any college within six years.[5]

In response to low completion rates, educators, reformers, policy makers, and foundations called for a concerted effort to increase the number of individuals with college degrees and certificates—an effort that has come to be called the "completion agenda." The administration of former U.S. President Barack Obama, Lumina Foundation, and the Bill & Melinda Gates Foundation all called for ambitious increases in the number of college graduates by the middle of the 2020s.[6] Many states set goals designed to contribute proportionately to the national goals.[7] In addition, the federal government and multiple foundations funded extensive research and reform portfolios.

Barriers to College Completion

Students and colleges will need to overcome a number of challenges to achieve the ambitious goals of the completion agenda. Community college students tend to face many serious barriers to success: low-income students are significantly overrepresented in community colleges,[8] and most need to strengthen both academic and nonacademic skills.

Despite the substantial needs of their student populations, community colleges are given comparatively few resources. In 2011, public two-year institutions spent about $8,100 per student; in contrast, institutions in the public master's sector spent just over $12,000.[9] Thus, the colleges whose students have the greatest needs have the fewest resources to address those needs.

In addition, community colleges are not well organized to promote completion. The features that have allowed community colleges to expand access may not be optimal to promote completion of programs that support deep student learning and that prepare students for success. The traditional community college employs a "cafeteria-style" or "self-service" model.[10] In this model, colleges provide many options and services, but students must find their own way through often complex or ill-defined programs. Such cafeteria organization creates problems in three areas: the structure of college-level programs, the intake process and student supports, and developmental education.

- *Structure of programs.* Community colleges are designed to facilitate enrollment to a heterogeneous student population with a wide variety of goals. Most offer an extensive array of courses and programs, and

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students have broad flexibility to decide when to enroll and at what intensity, what programs to pursue, and which courses to take within those programs. Students can easily stop their program and presumably return to college when it is convenient. The potential for transfer to many different four-year colleges further complicates students' choices. Research in behavioral economics demonstrates that individuals do not do a good job of making decisions when faced with such large sets of complex and ill-defined choices.[11]

- *Intake and supports.* With limited resources, community colleges are unable to provide comprehensive advising to all students to help them navigate these complex institutions. There are often many hundreds of students for every counselor or advisor. As a result, college intake and advising often consist of a brief face-to-face or online orientation and a short meeting (not always mandatory) with an advisor, focused on registering for the first semester's courses. Most colleges do not provide an organized process to help students form long-term goals and design an academic program to achieve those goals. Rather, students must recognize when they need help and seek it out on their own.[12] Moreover, most colleges do not closely monitor students' progress toward their goals or through programs.
- *Developmental education.* Students' progress is often stalled by lengthy developmental course sequences. All community colleges assess students' academic skills at entry, and based on these assessments, college staff advise the majority of students to enroll in developmental education courses. Yet traditional developmental education is often not able to prepare students to succeed in college-level courses. Most students do not complete their assigned sequences, and enrolling in developmental education courses does not, on average, increase the probability that students will complete college-level courses or achieve other desired outcomes.[13]

Colleges have been willing, and are often enthusiastic, to experiment with new practices and strategies, but they have frequently directed them at one segment of the student experience, usually the beginning.

In short, community college students face many barriers to completion, and the funding, structure, and organization of the colleges make it difficult to help students overcome those barriers. These issues will have to be addressed if colleges are to increase their completion rates and overall performance substantially.

The Limitations of Traditional Reform

During the last two decades, community colleges have attempted many reforms to improve student success.[14] The Achieving the Dream: Community Colleges Count (ATD) initiative (http://achievingthedream.org/) illustrates the fundamental characteristics of the types of reforms that have predominated in this period. In 2004, Lumina Foundation and its partners initiated ATD and funded twenty-seven colleges to carry out a series of reforms

with the explicit goal of improving student outcomes. Subsequently, several hundred colleges participated in ATD. The developers articulated an underlying theory of action urging colleges to use their longitudinal data to identify barriers to student success and apply evidence-based reforms to correct those barriers, leading to increased completions. In addition to financial support, ATD colleges benefited from technical assistance by coaches and researchers and participated in workshops and conferences sponsored by ATD. Emblematic of the completion agenda, ATD represented an ambitious and well-funded initiative designed to introduce reforms that would lead to increases in college completion.[15]

In 2011, MDRC, in partnership with the Community College Research Center (CCRC), published a report describing the interventions and the first five years of ATD experience among twenty-six of the twenty-seven initial college participants.[16] The colleges introduced reforms in three broad areas: student support services, instructional support (such as tutoring), and changes in classroom instruction. Every college had some intervention devoted to improving outcomes for developmental students, and the majority of ATD reforms focused on helping students during the early stages of their college experience.

In general, the early ATD experience illustrates the dominant characteristics of community college reform during the completion agenda era. Colleges have been willing, and are often enthusiastic, to experiment with new practices and strategies, but they have frequently directed them at one segment of the student experience (usually the beginning); and they have generally reached a relatively small number of students (although "light-touch" efforts have sometimes reached larger groups of students). The ATD evaluation found that despite enthusiastic reform activity, completion rates on average had not increased for participating colleges at the end of five years. Outcomes from a 2009 follow-up program, the Developmental Education Initiative funded by the Bill & Melinda Gates Foundation and designed to scale up promising practices introduced by ATD, were similarly disappointing.[17]

Evaluations of targeted reforms of the type implemented by the ATD colleges show that even when they have positive effects on short-term outcomes—such as enrollment and success in entry-level college courses—the benefits to student participants tend to fade over subsequent semesters. This was the case in a rigorous evaluation, conducted by the National Center for Postsecondary Research, of learning communities in six community colleges.[18]

The Accelerated Learning Program (ALP) developed at the Community College of Baltimore County provides another example of an intervention with short-term positive outcomes but no effect on graduation rates. ALP is a remediation model in which students referred to developmental reading are placed into a college-level English course with an additional academic support section. An evaluation showed that ALP students were 32 percent more likely to complete the first college-level English course within one year than similar students in standard developmental reading.[19]

In the guided pathways model, the college intake process is organized first to help students choose a program of study and then to address academic weaknesses that would prevent students from succeeding in their chosen program.

But despite the encouraging success of ALP, initially the college's three-year graduation rate for first-time, full-time students did not improve.[20] Although the student body at the college changed over this period, and the three-year completion rate is not an ideal measure, these findings suggest that the college had not been able to convert success in remedial reforms into broad institutional improvement. More recently, building on the success of the ALP model, the college has adopted a comprehensive approach to reform, based on the guided pathways model.[21]

These examples suggest that isolated interventions, even when they yield positive outcomes for participants, do not generally improve institutional graduation rates. National trends in graduation rates support this conclusion. As noted above, data from the 1990s showed that less than 40 percent of entering community college students graduated from any institutions within six years. Data from the National Student Clearinghouse for the cohort of students who entered in 2007 showed that 38 percent had completed a degree or certificate within six years.[22]

Two broad reasons help explain why institutional aggregates and broad measures of college performance have been immune to focused reforms and the college completion agenda. First, pilot projects rarely scale. Initiatives usually start by testing a practice using a small number of students, with the expectation that a successful practice will be used on all students in the target population. Pilot implementation makes sense in theory but rarely works in practice. Sometimes initial grant funding runs out, and the initiative fades away. Small pilots can rely on a small group of activist faculty, administrators, and stakeholders who are enthusiastic about reform, and they can be carried out without disrupting normal practices at an institution. But scaling requires engagement of a much larger segment of the faculty and may require budgeting, schedule, personnel, and administrative changes.

The ATD evaluation showed that 52 percent of the interventions reached less than 10 percent of their target populations, and only about one-third reached a quarter of them.[23] The larger-scale interventions tended to be what the authors referred to as "light-touch," providing services for five or fewer hours. Such limited penetration cannot be expected to increase the overall institutional performance numbers. And, as noted, the explicit and funded effort to scale apparently successful interventions through the Developmental Education Initiative was similarly disappointing.[24]

The second reason why discrete interventions might not move institutional performance measures is that in most cases, they address only one segment of a student's experience in college, rather than touching each progressive phase of the student's experience. This is known as the problem of *vertical scaling*. For example, as was the case with ATD, many reforms focus on developmental education, the first stage of many students' college careers. But if a student's college-level program is difficult to follow, and if the student does not continue to get support and guidance, any early benefit from the reform is likely to dissipate as the student progresses. A 2013 simulation that tested the effect of specific reforms on overall graduation rates found that a 20 percent increase in the share of students who complete a first college-level math course would generate only a 2.5 percent increase in the graduation rate.[25]

This simulation and the research cited above suggest that substantially improving rates of student progression and completion requires changes in practice throughout students' college experience, not just at the front end or any one segment. Indeed, while students deemed college-ready upon entry are more successful than those referred to developmental courses, the majority of each group do not end up earning a college credential, suggesting that even students judged to be academically prepared face barriers to success in college-level coursework. To state the problem differently, many of the initial reforms motivated by the completion agenda were in effect not designed to promote

completion but, rather, to improve an intermediate step. Improving the intermediate outcomes had only modest effects on overall completion. Thus while these colleges may have had measureable student success goals (as the comprehensive model suggests), they were the wrong goals.

The Need for Comprehensive Reform

To make significant institution-wide increases in completion, colleges must first focus on the appropriate measures of student success. It is important not just to measure the outcomes for the small number of students in a pilot program or intermediate outcomes that do not necessarily lead to institutional change. Second, colleges must have a culture of evidence that leads them to act on the measureable student outcomes. Substantial improvement requires a continuous process of reform and assessment of evidence of improvement that must become embedded in the college culture. Finally, reform cannot be limited to a small group of students or one segment of the student experience. In summary, comprehensive reform requires three elements: a focus on measurable student success; a culture of evidence; and an intentional and cohesive package of programmatic components.

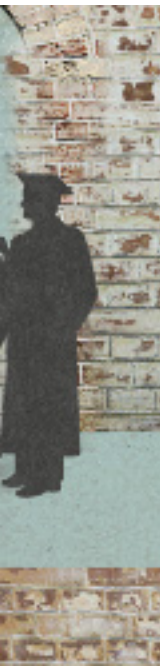
The *guided pathways model* is one example of a comprehensive reform that combines these three elements.[26] It comprises an intentional and cohesive package of components, built around the development of simplified, well-organized, and easy-to-understand college-level programs of study. In this model, the college intake process is organized first to help students choose a program of study and then to address academic weaknesses that would prevent students from succeeding in their chosen program. The model is explicitly designed to support students throughout their college career by helping them choose a program, enter the program, complete the program, and make a successful transition to subsequent education or employment, and it emphasizes the need to monitor students' progress, giving frequent feedback and support as needed.

There are a growing number of examples of comprehensive reforms that incorporate many elements of the guided pathways model. Perhaps the most complete example is Guttman Community College, which is part of the City University of New York (CUNY). Guttman was created to use research-based reforms to improve measurable student outcomes. The college developed a comprehensive design that combines enhanced advising, expanded services to help students choose majors, significant instructional reform, and profound curricular redesign and simplification. Students take a common first-year curriculum and choose from a small selection of programs during their second year. The college's designers selected the fields for these programs of study based on an analysis of the needs of the local labor market. One purpose of the common first-year curriculum is to guide students through the process of choosing an appropriate program of study. This includes exposure to workplaces in related fields and visits to bachelor's degree programs at four-year CUNY

colleges.[27] Each associate's degree program is also designed to allow students to transfer to any of CUNY's many nearby four-year colleges. Guttman is relatively new, so it has not been rigorously evaluated, but the three-year graduation rate was 48 percent for the college's first cohort, a rate that is more than twice the graduation rate for CUNY community college students overall. Although Guttman students are similar demographically to other CUNY students, there may be unmeasured student characteristics that account for some of this difference. Nevertheless, initial results are encouraging, and the college faculty and administrators are committed to continuing to improve their services based on evolving evidence on student outcomes.

City Colleges of Chicago (CCC) provides another example of a scaled comprehensive reform using guided pathways. In 2013, CCC leadership developed a five-year strategic plan designed to double graduation rates and further increase awards and four-year transfers. The reform created clearly structured programmatic pathways that are aligned with requirements for success in careers and further education and that have integrated supports to help students enter and complete a program of study as quickly as possible. Starting in fall 2014, all degree-seeking students were required to choose one of ten focus areas (each aligned with a major area of occupational demand in Chicago) and to follow a default full-program plan created by faculty and advisors for each program. CCC advisors monitor students' progress along their program pathways, providing regular feedback to all students and support for those not adequately progressing. Since 2013, the CCC three-year graduation rate has increased from 7 to 15 percent.

The Accelerated Study in Associate Programs (ASAP) is another CUNY reform that follows the student from registration to graduation. This program combines extensive advising, some financial assistance, curricular reform, and a requirement to attend full-time. The program puts a strong emphasis on frequent counseling, both to help students choose their programs and to keep them on track toward completion. A random assignment evaluation by MDRC found that over a three-year period, 40 percent of all ASAP students had earned a degree from any college,



Ultimately, comprehensive reform will require two- and four-year colleges to better coordinate their programs so that coherent pathways can be developed to span the transfer process.

while only 22 percent of the control group had.[28] Although ASAP includes all three elements of the comprehensive model noted above, by 2015 ASAP had not enrolled enough students for outcomes to be reflected in overall college graduation rates, but the positive evaluation results prompted the New York State and City governments to allocate $77 million in new money for four years to expand ASAP to 25,000 students by 2019. One college, Bronx Community College, will enroll all of their students in ASAP.

Conclusion

This article articulates a comprehensive change model that includes a focus on measurable student success, an intentional and cohesive package of programmatic components, and a culture of evidence. All of these elements are clearly present in the three examples described in the previous section. In all of these cases, the colleges and districts are focused primarily on student completion, the underlying theories of change are based on combining programmatic practices that support and guide students throughout their college careers, and the institutions are committed to tracking student progress and using evidence on student progress and program effectiveness to improve graduation rates.

Narrowly targeted reforms that either treat too few people or are limited to one segment of the student experience have a limited effect on student completion. In contrast, the comprehensive models discussed here, as exemplified by the guided pathways model, are fundamentally based on the integration of a set of coordinated reforms.

Whether a college chooses to develop guided pathways or other comprehensive models of reform, it will face a variety of barriers to successful implementation. If reforms are to comprise a cohesive package to support students throughout their college careers, then faculty must be willing to work collectively within and across programs and departments. This may come into conflict with a culture of faculty autonomy. Similarly, advisors must work closely with faculty—a collaboration that is weak in many colleges. Ultimately, comprehensive reform will require two- and four-year colleges to better coordinate their programs so that coherent pathways can be developed to span the transfer process. These are the collaborations and broad institutional policy changes that have typically been missing from higher education. These are the reforms needed now. ■

Notes

An earlier version of this article was published as "The Need for Comprehensive Reform: From Access to Completion," *New Directions for Community Colleges,* no. 176 (Winter 2016).

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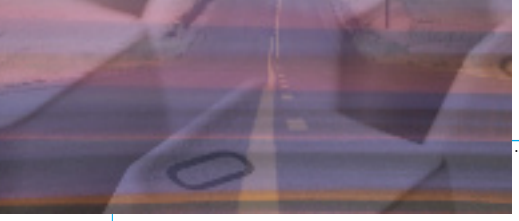


Enterprise IT Applications: The Engine for Student Success

The national focus on improving community college student completion rates is not a recent phenomenon. Origins of the success agenda can be found in the mid-1980s, applying then-current persistence and involvement theory[1] to the student of the public, two-year, nonresidential college.[2] In trying to understand low retention rates, this literature considered the unique academic, social, and economic challenges of community college students. Over time, with little improvement in persistence and completion, calls for greater accountability and affordability intensified at local, state, and national levels.[3] Coincident with these calls—and with ever-increasing recognition of the personal, social, and economic value of the associate's degree[4]—came more research focused on producing a positive impact on community college student outcomes through significant practice and process change—especially change related to increasing access and success equity in higher education.[5]

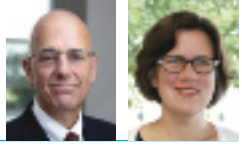
The continued research and encouraging findings created stimulation for privately and publicly funded entities to collectively form national reform movements for student success. For example, Achieving the Dream (http://achievingthedream.org/), which began as a national initiative in 2004 and now includes over 200 community college members, has identified a variety of strategies to improve retention and completion and close achievement gaps. Moreover, highly respected organizations such as the American Association of Community Colleges (AACC, http://www.aacc.nche.edu) and the Center for Community College Student Engagement (CCCSE, http://www.ccsse.org/center/) have for many years facilitated exploration, development, and employment of high-impact practices. More recently launched is the AACC Pathways Project, which intends to help community colleges design and implement guided academic and career pathways at scale. Manifesting out of these monumental efforts is a litany of prescriptions for improving student retention and completion. For example, early-alert programs identify at-risk behaviors and apply interventions designed to keep students on-track; academic and career advising models provide an integrated, proactive, and personalized approach to student support; comprehensive academic planning encourages students to begin with the end in mind; first-year experience classes help students prepare for the transition from high school to college; and accelerated, often co-curricular, learning programs reduce time in college preparatory classes.

Among the many promising practices for success, the guided pathways approach is currently receiving much attention. This model promotes measurably increasing student success by developing clearer programs of study, as well as by giving students the support, services, and tools to choose a program early—preferably during college entry and admissions processes—and then to map a pathway for completing the program. Essentially, the pathways approach is about providing the systems and support for students to "choose a program, enter the program, complete the program, and make a successful transition to subsequent education or employment."[6] It's simple: select, enter, and complete. However, the reality is not so simple. Implementing pathways requires curricular, technological, and process-level change at institutions that have long operated on an *a la carte* model, one that often attempts to be all things to all students. The model frequently includes the presentation of a mind-bending array of options via some combination of printed media, self-service web-based systems, and hopefully, dialogue.[7] Students are frequently required to make uninformed choices on academic program, course selection, and more. All too often, these decisions put them on a path to dropout or, perhaps in the best of the worst cases, to elongated time and cost to completion.

Successful implementation of pathways will require the full focus and support of the entire campus community. For example, at Columbus State Community College, the pathways model is a centerpiece of a strategic priority to increase student success. Our plan intends to relentlessly provide each student, from start to finish, with the support and services needed to develop an individual pathway to success. However, to effectively develop and bring pathways to scale, significant institutional change is required, including technological change. If all 40,000 students at a large community college are to develop career and academic plans that include progress tracking, intrusive advising, pro-active intervening, anytime accessing of success services, and more, a primary engine of successfully implementing success-focused, scalable change is the sophisticated IT infrastructure and enterprise applications. Unfortunately, this engine was often built decades ago.

In "Top 10 IT Issues, 2017: Foundations for Student Success," Susan Grajek and the EDUCAUSE IT Issues Panel discuss "Next-Gen Enterprise IT" (Issue #9), noting that the enterprise applications used in, or built by, colleges and universities are "often older than today's college students."[8] Furthermore, and of significant consequence, at the core of higher education

Connections Editor: **Bret Ingerman**



By MICHAEL BABB and JENNIFER ANDERSON

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enterprise systems is an ERP (student information, human resources, finance, and payroll systems) with primary technologies and design principles born near (or even way before) the inception of the 21st century. This issue exists at the comprehensive university, at the small liberal arts college, and at the community college and is occurring in the context of significant change. Institutional change is moving ahead, and the IT organization is trying to keep up. This often includes laying newer technologies—like those needed for pathways, early-alert, and other proactive student services—on top of older core technologies. The result is that IT enterprise application teams are forced to somehow, someway integrate and interface these disparate systems. The integration can include some sort of extract, reformat, transfer, and load process, with batch jobs executing at timed intervals. If one piece fails, the entire "system" breaks. These adjunct systems provide essential functions like relationship management, workflow, document management, event planning, and more. They also create considerable expense and the need for specialized resources to support them.

Issue #3 in the EDUCAUSE 2017 Top 10 list is the need for data-informed decision making. This issue represents an additional confounding factor in the context of aging IT systems. While there is ever-increasing demand for data and information to plan and evaluate student success interventions, the reality is that the data needed for informed decision making is not always readily available. The focused use of data is a guiding principle of Achieving the Dream, AACC, and similar organizations. However, much like other IT-dependent systems, community college institutional research offices depend on outdated and unconnected technology. The aforementioned layers of IT systems add additional complexity, since the data needed to evaluate a particular intervention may reside in many disconnected systems or in no systems at all, which is the case when the intervention is being tracked locally on someone's desktop spreadsheet. Larger institutions may have had the resources to develop operational data stores or data warehouses that alleviate some of the issues, but these may also have been too narrowly focused on a particular area and not organized holistically so that all data resides together. This greatly adds to the challenge that community colleges face in measuring progress and determining "what works" for specific students. This information is vital for institutions facing tight budgets and difficult decisions about resource allocation.

The way forward for IT is . . . what? If IT and its enterprise applications are to be an engine powering the 21st-century community college, then consequential, complex, and costly work lies ahead. A myopic focus on the ERP and its replacement may be insufficient, since the current suite of applications supporting essential functions likely extends well beyond this system. More productive may be an exhaustive approach that enables movement toward an enterprise applications architecture that, first, supports the 21st-century community college. Next-gen enterprise IT includes applications and architectures that align with the institution's strategic priorities. A well-conceived architecture increases institutional capacities and capabilities to scale success priorities by providing a framework for coherently moving to next-gen enterprise IT. The framework includes standards and guiding principles for moving toward an intentional, truly integrated structure of applications that offer the support and services needed by our students to complete their goals. It also furnishes the data and the tools to make highly consequential decisions—decisions that significantly advance the success agenda that started several decades ago. ■

Notes

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Data Information Literacy and Application

By now, many people in higher education have at least heard of data management, due in large part to various federal funder requirements of a data management plan for all grant proposals. But in the classroom, if this topic is covered at all, the discussion is often concerned with how students should document the data that they produce in the course of research. This is a valuable skill and one that all students should build into their practice. However, equally important is the need for students to understand how data can be reused, what sort of quality assurances should be made on the data, and which data is implicitly gathered and reused all the time by virtue of our online interactions.

All of these concerns fall under the large umbrella of *data information literacy*. The term *data literacy* is sometimes used interchangeably, but it has a historical definition relating to statistical and numerical fields (e.g., understanding standard deviations or how to read a graph). Data information literacy (DIL) has a more expansive definition and concerns the activities of the data creator and consumer. In an effort to create standard approaches to DIL, members of the Data Information Literacy project (http://www.datainfolit.org/), an Institute of Museum and Library Services (IMLS) grant-funded initiative, investigated the DIL needs of researchers and developed a curriculum to address those needs. They also identified twelve competencies associated with DIL: cultures of practice, metadata and data description, data management and organization, data curation and reuse, data ethics and attribution, data conversion and interoperability, data preservation, data processing and analysis, data quality and documentation, data visualization and representation, databases and data formats, and data discovery and acquisition.[1]

Competencies like data management, organization, and interoperability factor heavily in the data creation process, as do data preservation and curation. A solid foundation in these areas can help ensure that data is available for reuse by data consumers, who in turn should be well acquainted with other competencies, such as data discovery, attribution, and quality. Students who engage with this ecosystem of competencies would—hopefully—gain understanding into the role that data plays in the research lifecycle and scholarly communication.

Data generation is prolific, thanks to workflows and capture systems made possible by current and evolving technologies and an increased focus on data-driven decision making. In a lab or research setting, this data is often explicitly collected or created. Data is downloaded from instrumentation, recorded in notebooks or software, or pulled from repositories for analyses and manipulation. Good DIL practice would ensure that at the various points in the data lifecycle—for example, creation, documentation, annotation, analysis, assurance, preservation—students and researchers are actively involved. But what about the data that, even though it informs decision making and shapes society, is not explicitly collected or created? What about the data that exists in our *lives*, rather than in research projects or laboratories?

Our Distant Data

Every day, those of us who interact with the Internet or use networked technology are releasing data to various entities. Data about our shopping and reading habits, our financial information, our location—some of the most personal and precious data about who we are as individuals—is collected, stored, aggregated, analyzed, and sold by and to corporations across the globe. More often than not, people have no idea which parts of their interaction data are being used, nor do they have a mechanism to restrict that use while still engaging with the online service. This is in part due to the onerous and confusing Terms of Service (ToS) that so many of us click to accept without reading.

ToS are written as legal documents, not for a layperson. Major services like Google, Facebook, and Apple do not provide simple synopses for people to understand the agreement they are entering into. Certain websites— like Terms of Service; Didn't Read (https://tosdr.org/) and tl;dr Legal (https://tldrlegal.com/)—attempt to provide clarity of ToS statements, while tech reporters and bloggers do the same in their columns.[2] But for these explanations to be useful, people need to (1) realize that blindly accepting ToS may be unwise and (2) know that there are resources like these out there.

Unfortunately, in the United States there is no authority to mandate that these companies simplify their ToS. In some European Union countries, privacy commissions monitor companies to ensure compliance with consumer protection laws, which include provisos that companies not place an undue burden on the consumer.[3] Turning back to DIL, how could the competencies help mitigate these issues? The "distant relationship" between the individual and that individual's data—a relationship created by social media and other online interactions—affects both the producer and the consumer roles. The DIL competency that concerns ethics and attribution relates to the intellectual property, confidentiality, and privacy issues around sharing and using data. In my experience, however, most of the training related to those issues concerns health data or other

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By YASMEEN SHORISH

sensitive data in the research sphere. How much instruction are students receiving on this topic with respect to routine online interactions?

Student Engagement

Certainly, some colleges and universities are considering the ethical concerns around accessing and using student data as learning analytics and other evaluative metrics.[4] There has also been some effort to educate students on data privacy in the K-12 education system.[5] In higher education, however, concentrations in personal data use and privacy fall into computing, cybersecurity, or law curricula. Students studying marketing or media may learn about the ethical issues related to social media, but the ethical competency related to DIL is not well integrated into general education.[6]

This presents an opportunity for academic libraries and their learning partners. Whereas certain DIL competencies, like data preservation and analysis, may be best learned while handling data, the ethical competency can be bundled with other information literacy strategies, such as the ACRL Framework for Information Literacy for Higher Education (http://www.ala.org/acrl/standards/ilframework). Like the DIL ethics competency, the frame "information has value" has often been applied to highlight the ethical use of information and to create awareness of the economic models that influence information access. Yet it also has a focus on the individual as information creator and active participant. It would not be difficult to parley this into a lesson on the "distant data" that students produce and give away or trade for services.

The myriad ways that we produce and consume data—in research, in learning, and in leisure—can make it difficult to determine how best to scope this instruction. A recent article by Megan Sapp Nelson helps structure scaffolded instruction in DIL.[7] Although Nelson does not explicitly address teaching the ethical complexities that may exist with our distant data, the topic certainly could be addressed in the "personal information management" tier of instruction.

The Result

In some ways, the trading of our data in online interactions occurs as unconsciously as breathing. We do not see packets of data leaving our machines and going into a large bucket of other data, where some process occurs and money falls from the bottom, into a corporate wallet. Yet that is essentially what is happening. Moreover, there may be other entities watching our data and tracking our movements and decisions purely from the data that is produced. One of the core principles of information literacy has been critical evaluation. Essentially, that is what is underlying the DIL ethical competency: not just the critical evaluation of the data collected in the course of research, and its suitability to sharing and the risks associated with collecting it, but the critical evaluation of the *systems* that we work/live within and the data that those systems collect and use.

There are surely convenience benefits associated with the machine learning that occurs on distant data. Netflix recommendations and Amazon sale alerts are some examples. More education for students on how their data supports these systems does not preclude individuals from using those systems. Rather, it helps demystify the domain and provides students with some level of agency in the data exchange. As individuals become more aware of how critical their data is to the global marketplace and to the intelligence industry, they may feel more enfranchisement. Here is an opportunity to inculcate students with that lifelong learning mentality. As they consider the data ownership and privacy limitations that they may be (unwittingly) accepting, maybe some of them will recognize the ethical quandary. Perhaps a DIL intervention across curricula will result in a more engaged populace, ready to interrogate the systems that capture our distant data, whether in the classroom, in a research environment, or in society at large. ■

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Antigonish 2.0: A Way for Higher Ed to Help Save the Web

I remember when the World Wide Web was going to revolutionize everything. I don't mean the techno-centric narrative of automation and *The Jetsons* that bursts repeatedly out of our culture, like a pimple, every generation or so. I mean the web that was going to connect us to each other. The one that was going to allow us all to produce and contribute to a shared world of digital artifacts. One without gatekeepers.

More than a decade after Web 2.0 heralded a connected, participatory world and three decades after Richard Stallman's "GNU Manifesto,"[1] the web has instead become, in far too many of its corners, a fetid stream of ugliness and sensationalism. The web has become media. Attention—not voice or connection—is the currency of media.

Mike Caulfield, director of blended and networked learning at Washington State University, talks about the structures behind the current state of the web in the opening column[2] in this *EDUCAUSE Review* New Horizons series: how the social media model of stream communications amplified decontextualization and reactive response on the web.[3] Technology entrepreneur Anil Dash also laments the web we lost.[4]

Meanwhile, I wander around in a social sphere increasingly calibrated for constant hits of scandal and outrage, and like a frog boiling in a pot, I wonder what to do. Hyperpartisan sites—run on business models that profit from both sides of the binary[5]—fuel an attention economy bent to the purposes of autocratic governance. Facebook algorithms and 24-hour news and platforms that privilege retweets over replies[6] feed out a steady diet of toxic narratives that encourage polarization and anger and lashing out.

If the web was indeed a revolution, it sometimes seems to have entered its Reign of Terror phase. But the resolution doesn't lie in a return to the equivalent of the monarchy—the old gatekeepers of institutional knowledge and power. *That* path leads to another Napoleon. Rather, the same higher education institutions whose hierarchy and gatekeeping the web was supposed to open up and democratize[7] are increasingly necessary partners in building *any* kind of democratic future for society, full stop.

That's because the web is a big part of where we live now. But we neither understand it nor know how to use it for learning. What we need is not a revolution, but a way to develop the local and global literacies needed to foster functional democratic participation. This won't just spontaneously generate out there on online platforms such as Reddit or Instagram. Neither will it happen in classrooms. Or community halls. But if we can find a way to weave all three together into a functional model, maybe there's a possibility.

> Higher ed has to be willing to look to people both in and beyond classroom walls as part of its purview.

The model I'm interested in was developed nearly a hundred years ago, on the North Atlantic coast of North America, in a landscape populated with fishing villages and hard-luck mining towns. Called "The Antigonish Movement,"[8] this renowned adult education experiment of the 1920s–1940s based in Antigonish, Nova Scotia, led to the development of local credit unions that still dot the landscape around Maritime Canada. Its vision was as education-focused as it was economic, with an emphasis on building literacy as an avenue toward civic participation. The Antigonish Movement addressed people's poverty and lack of agency by creating collaborative capacity for pushing back on the structures of their disenfranchisement.

I want to try it again. But I want to focus on a different sort of poverty and disenfranchisement: our current, widespread incapacity to deal with our contemporary information ecosystem and what the web has become.[9] The attention economy and the rising specter of "alternative facts" create demographic and ideological divides that operate to keep all of us disenfranchised and disempowered. Antigonish 2.0, therefore, is a community capacity-building project about media literacy and civic engagement.[10] In this era of profound political polarization, disinformation, and fake news, the project aims to frame and foster narratives of democracy and contribution. Antigonish 2.0 revisions the cooperative adult education tradition of the Antigonish Movement for a digitized world.

The original Antigonish Movement focused on

1. reframing people's understanding of the structures shaping their lives and prospects, and
2. exerting collective action within and on those structures.

It did so through three key structural components: mass meetings, a school for leaders, and study clubs. Antigonish 2.0 draws on that three-layer infrastructure to galvanize collective action at global, regional, and local levels.

Layer One. This distributed international network—already

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By BONNIE STEWART

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populated with 100-plus media and education leaders from around the world—will be our web-based equivalent to "mass meetings." Network members will develop, curate, and maintain an up-to-date resource hub, build presence and belonging using the Twitter hashtag #Antigonish2, and mentor other layers in their local communities. The network is the core of the model and how it will adapt its domain knowledge as the information ecosystem changes and shifts.[11]

Layer Two. Focused on institutional capacity-building and inclusive citizenship in K–12 and higher ed classrooms, this layer will develop regional hubs of expertise, resources, and conversation. These hubs will be institutional and centered around professional development events, as well as around a July 2018 summer institute—our "school for leaders"—in the founding town of Antigonish, Nova Scotia. The institute will bring together leaders from widespread institutional contexts to explore how the web can be utilized to combat digital and democratic polarization in the workplace and classroom.

Layer Three. This layer consists of the "study clubs": localized workshops for people in their own communities. These outreach events are the heart of Antigonish 2.0: hands-on opportunities to develop the practices and literacies needed by critical citizens and consumers in an attention economy. These coordinated local gatherings—workshops at libraries, discussion series in community halls, even kitchen parties—will aim to engage citizens in collective action based on local interests. These events will teach core media literacy—how to identify fake news—but will also encourage people to work together to build narratives and skills for thriving in an age of information and misinformation. Facilitators for this layer of the project will be trained at Layers One and Two but will work in their local communities.

Amy Collier, associate provost for digital learning at Middlebury College, speaks of the current juncture in our collective society as one in which "the work of education . . . cannot look like it did before."[12] I think she's right. Antigonish 2.0 offers a call to colleges and universities around the globe to consider how their resources—staff, faculty, students, space, digital infrastructures, brands—can be deployed at all three layers of the initiative.

But in order to *do* that, higher ed has to be willing *not* to look the way it has always looked. It has to be willing to lend a portion of its infrastructure and its time and its endowments to this integrated model of network plus institution plus community, even though this model does not factor in prestige rankings or research dollars. It has to be willing to look to people both in and *beyond* classroom walls as part of its purview.

Higher ed has done this before, in Antigonish and in many other renowned community and adult education projects. This time its success demands the cohering factor of the network layer, because the domain knowledge and web literacies required to turn this ship of state and social media around are not present at the helm of most classrooms today. Success also demands looking out to communities to build, together, the kind of civil society that can value what higher ed has to offer, beyond just credentials.

Higher ed is the key source of the cognitive surplus that will build Antigonish 2.0's resources and knowledge hubs. Most of the volunteers for the project's Layer One network are higher ed employees, volunteering personal time that's nonetheless based in expertise and knowledge they've built through higher ed programs, higher ed jobs, higher ed grant projects, and higher ed Internet infrastructure.

The web was supposed to open up higher ed. In a model like Antigonish 2.0, higher ed may be the lever needed to reopen the web to its participatory, democratic potential.

I believe *that* would be a revolution worth aiming for. ■

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Why Effective Analytics Requires Partnerships

The word *analytics* means many things to many people. For the purposes of this article, we define it as "the availability of data to make strategic, tactical, and operational decisions." The lens that some in higher education use is student success analytics. This comes principally in two flavors: success over a career or program, and success within a course. Another lens used is "business intelligence," which can include our prior two examples but most often refers to the use of data to better understand the financial health of operations, departments, schools, programs, and just about anything else that can be measured and analyzed.

We are not here to debate what analytics is or to make the case for why it is important. Others have already done so. We are here instead to say that data is a critical component in the definition of a system (people, processes, tools, and data) and that it is worth understanding how an institution can best position itself to secure value from data (analytics). We are also here to explain why we believe that a partnership between the Chief Business Officer (CBO) and the Chief Information Officer (CIO) is foundational and why we would add the provost as well.

People, processes, tools, and data are critical to effective analytics—as are business, technology, and academic leaders who can partner to find the right investment balance.

Provosts are the keepers of the academic mission, and it is *this mission* that CBOs and CIOs are supporting. Deans and faculty need analytics they can depend on so that they, in the spirit of shared governance, can better manage and accomplish their mission. So although this article is geared to the importance of the CIO and CBO partnership, we should first acknowledge that those charged with the execution of the academic mission must trust that the CIOs and CBOs have their best interests and those of the mission in mind. CIOs and CBOs must understand what the provost considers to be critical success factors and must transparently draw these out into the open. The starting point is to ensure that the provost agrees and stays integrally connected.

Far too many institutional leaders believe that IT systems are primarily about tools. Purchase a service from (name your company), and a campus will leapfrog years of data neglect. License tools from (name your company), and the college/university will instantly become a data-driven institution. Neither of these approaches will work unless significant additional investments are made. Remember, people, processes, tools, and data form the tetrahedron of a system and its value. In addition, proper data management should cross, not be bound by, IT systems.

From our diverse perspectives, we believe that each of these four system areas needs to be addressed—not just tools. People must possess up-to-date skills and have the time available to devote their skills to analytics. These skills vary, and they are not the same as the skills required to be proficient either functionally or technically with enterprise systems, which produce the data on which analytics depends. Enterprise systems themselves are important sources of data, but those sources require consistent definitions, and they need to be staged correctly to be of most value. Processes also must be defined in consistent ways to ensure that data quality is protected, and data should be housed in ways that optimize it for analytics outside of the enterprise systems. Each of these points requires that CBOs (the keepers of many of human resources, finance, and other functions and processes) and CIOs (the leaders of systems architecture) work together. CBOs are responsible for college/university budgeting, capital planning, and other finances, and they need to understand why the correct investment in and positioning of people, processes, tools, and data are critical to the quality of the analytics capabilities.

This quality thus depends on a partnership between those with functional expertise and those with technical expertise, even "embedding" those with technical expertise in functional areas. As Keith McIntosh, vice president for information services and CIO at the University of Richmond, noted at the recent EDUCAUSE/NACUBO Enterprise IT Summit: "Technology is a team sport." It is a departure from the silo tendencies of many higher education institutions. We must move to a culture of data-informed decision making, and that can happen only with the effective use of data to provide actionable information. Other key partnerships are also needed to progress this move, particularly in achieving agreements on and acceptance of data definitions, data governance, and data usage. Institutional research officers, for instance, typically work in these realms but are not always brought into the mix. We also believe that this "team sport" could be positively impacted by partnerships between higher education professional associations such as NACUBO, EDUCAUSE, and

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AIR (Association for Institutional Research), each of which has identified effective analytics as a strategic focus in support of its members.

All higher education institutions are under fiscal distress. Every dollar used for making an institution "analytics-ready" is a dollar not available for faculty hires, for student support, for facility needs, or for the programs that form the reputation and strategic direction of the college or university. So we *have* to make sure that we balance our spending—not underspend and not overspend. Partnerships ensure that we have a fighting chance, for the long haul, to find the sweet spot. Some level of investment is needed, and this does not happen by magic, nor does it happen on the cheap. Nor is it a one-time occurrence, since IT systems require periodic refreshing. We would also argue that it does not happen by wishing that a service outsourcer or software company could solve our problems for us.

What does this mean for CIOs?

1. Understand that infrastructure for comprehensive data initiatives truly requires that CIOs and CBOs be on the same page for architecture, goals, requirements, risks, and costs. People, processes, tools, *and data* are part of systems. The best systems cannot be developed by CIOs alone but must be developed in partnership. And that this is a long-term investment decision if you have not already addressed this (and most of us haven't, fully).
2. Remember that both the CIO and the CBO are serving the institutional missions and that academic initiatives are the primary drivers. Do all you can to learn what the provost needs, and work backward, together, to put together a system that addresses institutional needs and the critical success factors related to the missions.

What does this mean for CBOs?

1. Ask for the CIO's perspective on the data systems that are in place. Take funding off the table at first so that you do not limit the conversation at the earliest stage. Come to a common understanding of the choices and tradeoffs in investments.
2. Understand that effective analytics requires an investment plan, with many participants contributing to the new system. Employees will need the skills and the time to engage. Fully fund the project, the transition, and the resulting operation. This will likely require both one-time and ongoing funding.
3. Hold the CIO accountable for the success of the service you funded (assuming the CIO is the person responsible overall). Do not hold the CIO accountable for risks you agreed together to take. Hold yourself accountable for the business and functional processes required to make analytics effective. Work with the CIO to establish and maintain data governance that instills a culture of trust in the results of these initiatives.

What does this mean for the CBO/CIO team?

1. Engage and lead other key leaders in developing plans for effective analytics.
2. Partner in championing analytics projects that focus on strategic objectives for the institution to meet its mission. What will make a difference for its success and sustainability?

People, processes, tools, and data are critical to effective analytics—as are business, technology, and academic leaders who can partner to find the right balance. It is important to the long-term viability of our higher education institutions that we get this right. ■

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