



 Mighty Guides



DATA & ANALYTICS

Improving Decision Making
in Higher Education

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FOREWORD

In 2016, the *New York Times* reported that of all the jobs created in the United States since 2008, 99 percent went to people who had some college experience; 72 percent went to people who had at least a bachelor's degree.

Gallup finds that 70 percent of Americans now consider a college education “very important.” In 1979, that figure stood at just 36 percent.

Driving the point home, according to the Bureau of Labor Statistics, the percentage of high school graduates opting for higher education has risen in each of the past three years. Why? A Georgetown University study predicts that 3 million jobs will be left unfilled in 2018 because workers lack the requisite skills.

We are seeing these trends reflected around the world, and despite what we hear about shifting demographics, budget cuts, and the returns on investment students receive, the numbers point to an era in which student success will drive our shared prosperity like never before.

That's why we've asked thought leaders across higher education and the private sector to share their perspectives on how best to seize the opportunities ahead. Recruiting. Retention. Development. Increasing efficiency. Breaking down the information silos that impede informed decision making across the campus. These are just a few of the topics you'll find covered in the pages to follow.

From best practices to peer recommendations to personal experiences, we've tapped into the collaborative spirit of higher education to help you create a modern, connected campus that meets every student, faculty, and staff member's need. We hope this guide is helpful as you lead your institution into the exciting times ahead.



Regards,
Jeff Ray
President and CEO
Ellucian

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Ellucian is the worldwide leader of software and services designed for higher education. More than 2,400 institutions in 40 countries rely on Ellucian to help enable the mission of higher education for over 18 million students. Ellucian provides student information systems (SIS), finance and HR, recruiting, retention, analytics and advancement software solutions. With more than 1,400 unique deployments of Ellucian's cloud and SaaS offerings, the company is one of the largest providers of cloud-based solutions. Ellucian also supports the higher education community with a range of professional services, such as application software implementation, training, education, and management consulting. Visit Ellucian at www.ellucian.com

INTRODUCTION

These are exciting — and trying — times for higher education. Many institutions face smaller, tighter budgets but feel the pressure to modernize technologies to stay competitive.

Through a generous partnership with Ellucian, we've spoken with 20 institutional leaders and experts to learn more about technology challenges and trends in five key focal areas: student success, cloud computing, analytics, advancement, and talent management.

We asked four experts the following question about data and analytics: How have you used analytics to address a major issue at a higher ed institution? What did you learn, what metrics were used to measure success, and what was the outcome?

During these discussions, the experts shared success stories about operational efficiency, student and staff engagement, and degree completion. They also recounted lessons learned from the challenges they faced while putting new technologies into place.

One thing they all agree on is that when implemented properly and executed well, technology is a platform on which all postsecondary learning institutions can build success. These professionals also highlighted the need for a holistic view of technology across the institution and a concrete plan for campuswide deployment as essential for success.

I trust you'll find these experts' insights and advice useful and that after reading this book, you'll come away with solid strategies to help advance the use of technology in your college or university.



All the best,
David Rogelberg
Publisher



Mighty Guides make you stronger.

These authoritative and diverse guides provide a full view of a topic. They help you explore, compare, and contrast a variety of viewpoints so that you can determine what will work best for you. Reading a Mighty Guide is kind of like having your own team of experts. Each heartfelt and sincere piece of advice in this guide sits right next to the contributor's name, biography, and links so that you can learn more about their work. This background information gives you the proper context for each expert's independent perspective.

Credible advice from top experts helps you make strong decisions. Strong decisions make you mighty.

Data and Analytics



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Across our alliance of 11 public research institutions, we're using predictive analytics to support our mission to produce better degree outcomes for all students regardless of race or generational status. The insights gained from creating a data-savvy culture on campus is helping us redesign our programs and processes so we can personalize how and when we support students in their academic journey.



BRIDGET BURNS

Executive Director, University Innovation Alliance



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THE FIVE BUILDING BLOCKS OF THE ANALYTICS ECOSYSTEM



KAREN A. STOUT

President and CEO,
Achieving the Dream

A nationally regarded community college leader, Dr. Karen Stout has served as president and CEO of Achieving the Dream since July 2015. She was named one of higher education's most innovative leaders in 2016 by *Washington Monthly* magazine. Prior to joining Achieving the Dream, Karen served as president of Montgomery County Community College (Pa.) for more than 14 years.



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Technologies such as cloud computing, advanced business intelligence systems, and visual analytics have redefined what community colleges can do with data, how fast they can do it, and how readily they can share and apply it. We have only begun to explore the possibilities, says Dr. Karen A. Stout, president and CEO of Achieving the Dream.

“However, the greatest data and analytics in the world won’t have any effect if they don’t fuel a decision or change something. That requires a culture—an ecosystem—where everyone involved understands, values, and demands fact-based decisions and strategies.”

Prior to her position with Achieving the Dream, Stout was president of Montgomery County Community College in Pennsylvania. During her 14 years as president there, the college developed an analytics ecosystem. “There were five building blocks to that ecosystem; an ecosystem developed so that you can use analytics to begin to aggregate data. It’s a system in which an institution can use qualitative research to look at what it has just aggregated and examine the pain points of the data to develop interventions and solutions. That is a whole process.” >>>



You must have a strong mission that explicitly states that the organization values the use of data in decision making.



KEY LESSONS

- 1 Analytics are only as good as the filter through which you view them, so it’s critical to fully understand the problem you’re trying to solve.
- 2 Tools and technology are essential to aggregating useful data, but without a culture that believes in the value of analytics, those data will never become actionable information.

THE FIVE BUILDING BLOCKS OF THE ANALYTICS ECOSYSTEM

The first of the five building blocks is *leadership*. Stout says, “From a leadership perspective, you must have a strong mission that explicitly states that the organization values the use of data in decision making. Data inform decision making—it’s something you look for in hiring new staff, that you build a leadership team around. You help members of your board develop those skills, and you commit to helping faculty engage with the data.”

“The second building block is strong *strategic and annual planning systems* that are aligned, that have activities and goals and big ideas connected to mission-centric outcomes,” says Stout. “All kinds of metrics came out that started at an aggregate level but then could be infused into program analytics.” For example, the college used annual program report cards and reviews to see how students were moving through programs to help them adjust and ensure program completion.

“The third building block is *systems and structure* that support an analytics ecosystem. From a structure perspective, that means, how do the Institutional Effectiveness office and the IT office work together in a collaborative way? That success requires collaboration between those areas.” Stout believes that a committed leader must be present. “It’s important to have the leader reporting directly to the president, being part of the decision-making body and really understanding that every decision is about a process and the data implication to it. When colleges are trying to build an analytics culture, they often forget that. You can’t design that culture on the back end of a decision. That work has to happen in parallel with your decision making.” >>>

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THE FIVE BUILDING BLOCKS OF THE ANALYTICS ECOSYSTEM

Technology tools are the fourth building block, Stout adds. “An organization must determine which tools it will be using. From my perspective, selecting the tools requires first an acknowledgement that it’s about disseminating the data in such a way that the IT organization isn’t the gatekeeper of the information; rather, the IT organization helps disseminate the data in ways that are visual, in ways that they can be manipulated so that deans, for example, and others on the ground can make decisions based on their ability to dig into the data on their own.”

Finally, Stout says the fifth building block is *helping people within the institution understand the importance of data*. “It is not just about the importance of data but the importance of pulling insights out of data rather than starting with the data, and then building interventions that may or may not be connected to solving the big problem. You have to look at the analytics, and then you have to build structures and systems to support what you’re finding from the analytics.” ■



BRENT DRAKE

Chief Data Officer,
Purdue University

Brent M. Drake currently serves as the chief data officer overseeing the Office of Institutional Research, Assessment, and Effectiveness at Purdue University, where he focuses on data related to student learning and attainment, overall institutional effectiveness, institutional reporting, faculty activity, and data analytics. He presents and publishes on many topics in higher education, including motivational models related to student success, retention enhancing programs, business intelligence, data analytics, and student success efforts.



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Brent Drake, chief data officer at Purdue University, spends his days using analytics to make students more successful. “One of the major focus areas our office points to is student success. Specifically, we’re looking at students’ academic success, so their grade-point average (GPA), their progression toward their degree, their retention, and ultimately their graduation are the key metrics we look at. We’ve worked on many projects over the past three years that include factors that affect that success—ways we can help move the needle on those metrics so that we can ultimately help more students be successful at the university.”

Currently, Drake says the university is using data to “provide a behavioral nudge for students toward more proactive behaviors. We’re pulling in a large array of data areas: our traditional academic record files, our learning management system, our ID card transactions, and our network log activity at the university.” Drake says, “We can look at malleable behaviors predictive of success on campus, then send messages to the students about them.” >>>



We can look at malleable behaviors predictive of success on campus, then send messages to the students about them.




KEY LESSONS

- 1 Organizations can use analytics not only to define the so-called “murky middle” students who may or may not succeed but also to push those midlevel students toward success by identifying and fulfilling their needs.
- 2 To be successful, tie analytics to concrete, well-defined goals. When clear outcomes are in place, it becomes easier to see where you want to exert influence.

Purdue also provides information directly to students to help them perform better. Drake explains, “Factors that can help with their success in class, like providing GPA comparisons to students who have been successful in their majors in the past; whether they’re attending class; whether they have a high Internet usage rate while they’re in class, which would imply that they’re not paying attention to the lectures; their tardiness to class; whether they’re logging in to the learning management system proportionately to their class requirements; and whether they’re using the discussion board topics in the class.”

“We provide information about the historical relationship between those behaviors and their ultimate success on campus,” Drake says. “Then, when they log in, they see their individual data points in relation to other students in their course or in their major or across the university.” He believes these programs may play a part in Purdue’s recent retention rate records for one and two years and the record four- and six-year graduation rates the university is setting.

Students find the analytics useful. Drake points out, “Every time we release a new module, we send a follow-up survey to the students. Overwhelmingly, the response is positive. When we ask them, ‘Do you want us to continue to use your data in this manner if it helps you be more successful in your GPA,’ around 90 percent of the students respond yes.” 

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Every institution can look at its cutoffs, where it has breaks of students who struggle based on GPA at the end of the semester . . . and reach out to those students in an email campaign or have their advisors follow up with them.

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An analytics project of this size might be more than some institutions are prepared for, says Drake, but he encourages, “Every institution can look at its cutoffs, where it has breaks of students who struggle based on GPA at the end of the semester—even if they’re not in academic probation status—and reach out to those students in an email campaign or have their advisors follow up with them. That is an easy pull for any institution. Registration behavior is also an easy pull for just about any institution out there. Colleges and universities can do those things without a heavy investment of time and resources, and it will have an impact on their student body.”

Learning from the programs that Purdue has instituted, Drake advises, “At the beginning of the process, you’ve got to be clear about which outcomes or metrics are of interest and on which you want to exert influence. Then, everything can flow from that in terms of looking at the resources, behavior, and technologies that can influence that goal. You’ve got to get that first step done.” ■



We've always had data, but it hasn't been easy to put together. Now we've moved to an era where we're using analytics to help student success and put students' needs at the center.



DIANA OBLINGER

President Emeritus, EDUCAUSE

ADOPT A FLEXIBLE APPROACH TO GLEAN VALUE FROM DATA



**PATTY
PATRIA**

**Vice President for
Information Technology,
Becker College**

Patty Patria is the vice president for Information Technology at Becker College. She has more than 20 years of experience in the IT industry, more than 15 of which are in higher education. She is responsible for providing strategic leadership in long- and short-term planning; managing administrative and academic technology; overseeing the Becker libraries; and overseeing the management of computer networks, servers, and personal computers. Patty also oversees information security and compliance requirements for the College.



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Patty Patria, vice president of Information Technology at Becker College, says, “We use analytics to help us more accurately forecast and target new student enrollment as well as improve retention.” In the past, Patria says her institution built homegrown dashboards in Microsoft Excel based on data extracted from their recruitment and student information systems.

“Last year, we for the first time tried to create a predictive analytics model to help us forecast which students would be an ideal fit for Becker by leveraging a small team of in-house personnel.”

“It didn’t work out so well,” Patria admits. “Our predictive model wasn’t all that accurate, but that’s OK. We have the philosophy that it’s OK to try and fail as long as it doesn’t negatively impact business.” Rather than staying with something that doesn’t work, this year Becker College is taking a different approach. >>>



The technology for analytics changes drastically, so you must continually make sure that you’re refreshing that technology.



KEY LESSONS

- 1** Maintain a flexible approach to using analytics in the institution. If there are potential benefits to trying a new approach or technology, then try it. If it doesn’t work, try something new.
- 2** Cloud-based technologies, like data warehousing and analytics, allow smaller institutions to employ strategies that have previously been used only by large institutions with large budgets and access to additional staff.

ADOPT A FLEXIBLE APPROACH TO GLEAN VALUE FROM DATA

Patria explains, "Instead of just focusing on the predictive models, we are looking at a comprehensive approach to enrollment management. Again, we formed a small team comprised of enrollment, marketing, and IT staff to evaluate multiple options, and then develop a new strategy. This year, our goal is to work with vendors that are experts in this space to help us run predictive models on potential students prior to us engaging them so that we have a better sense of which lead would actually turn into a student who enrolls. We're also trying to use marketing analytics and social media marketing to come up with new mechanisms by which we can target the prospective students that we've analyzed to see if the outcomes increase the number of students who enroll."

Patria's "let's try it" approach to analytics seems to work well with the evolving nature of technology and the capabilities available to institutions today. "The technology for analytics changes drastically, so you must continually make sure that you're refreshing that technology."

For example, one application the college used last year required a lot of hand-coding, which can be time consuming. The tools it uses today are much different. "Artificial intelligence engines that used to require coding now have drag-and-drop functionality in a graphical user interface; that makes generating predictive models much easier. You don't necessarily need the detail-oriented programmer skill set," she explains. "I think it's important to stay on top of the evolution of the tools in this market because they're changing so rapidly. This approach can change the way you run your analytics." >>>

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Our enrollment has increased every year for the past five years. . . . I think we're in that position because we continually look at the analytics, make decisions, and then make adjustments based on those decisions.

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ADOPT A FLEXIBLE APPROACH TO GLEAN VALUE FROM DATA

Cloud computing has also helped make analytics accessible to more colleges and universities. “The cloud is helping institutions expand the way they interact with data,” she says. “Many larger schools have their own custom-built data warehouses and dashboards, but those tools require a large staff, which in turn equates to a large budget. For smaller schools with tighter budgets, haven’t been able to get into the data warehouse market yet because the costs were too high or the tools weren’t available.”

“As we move more to the cloud, the whole data warehouse market seems to be changing, as well. It used to take anywhere from 12 to 24 months to set up the data warehouse. Nobody has the appetite to wait that long anymore. Technology advances will enable more smaller institutions to access real data warehouse and dashboarding tools,” Patria says.

The use of cutting-edge analytics and cloud computing technologies is paying off for smaller schools. “Our enrollment has increased every year for the past five years, so I would say that we’re in a better position than a lot of other small private colleges,” Patria says. “I think we’re in that position because we continually look at the analytics, make decisions, and then make adjustments based on those decisions.” ■

HOW ANALYTICS CAN IMPROVE STUDENT ASSESSMENT AND SUCCESS



**SUSAN
GRAJEK**

**Vice President, Communities
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EDUCAUSE**

Susan Grajek is EDUCAUSE's vice president for Communities and Research. She is responsible for research, benchmarking, and analytics programs and for formal and informal communities of practice. Before joining EDUCAUSE, she spent over 25 years at Yale University in a range of IT management and leadership positions. Grajek holds a Ph.D. in psychology from Yale.



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In her role as the executive responsible for all research, benchmarking, and analytics at EDUCAUSE, a nonprofit association and community of IT leaders committed to advancing higher education, Susan Grajek tracks the impact of technology on higher education. Lately, she has seen encouraging results in the use of analytics to further student assessment and advising.

“Student success is where I see a lot of interest and activity in applied analytics,” she says. “We’ve mainly focused on using analytics and technology to rethink, reframe, and re-architect the student advising process.” Much of the funding for this research comes from the Bill and Melinda Gates Foundation.

EDUCAUSE has explored technologies that enable institutions to help advise students and map their education. “If you think like a student,” says Grajek, “success comes from answering questions such as, ‘Do I have a plan for my education, or am I just winging it semester to semester?’ >>>



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KEY LESSONS

- 1** Predictive analytics can directly affect student success but require a clear, upfront strategy and the right institutional infrastructure.
- 2** Analytics can help identify student patterns that may lead them into difficulties and prompt intervention.

HOW ANALYTICS CAN IMPROVE STUDENT ASSESSMENT AND SUCCESS

Do I have a major, and do I understand the requirements are for that major? Have I created a plan for attaining those requirements? Am I on track in a particular course or with my plan to graduate in an affordable timespan? What can I do if I'm not?"

These are big questions, and no single analytics technology can address them. However, Grajek points out that the first steps to gaining insights from data have less to do with specific technology and are more about institutional readiness, how it collects data, how its systems talk to each other, and whether it has a clearly defined strategy.

"We try to be agnostic about platforms and technology specifics because what works for one institution won't necessarily work for another," says Grajek. "Sometimes that has to do with the institution's specific aims and specific focus areas or simply what its current architecture can handle. Some institutions want to buy off-the-shelf, turnkey solutions; others want to create their own analytics infrastructure that enables them to develop and manage their own algorithms."

One thing most colleges and universities can agree on, however, is how they measure success. "The most common metric that institutions seem to use to judge whether they're having success is the student completion rate or the persistence rate." >>

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I think technology should always be in the service of strategy. Make sure that you've got the people and the process, the investment, the policies, the understanding of the outcomes you want to achieve in place before you start looking at technologies.

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HOW ANALYTICS CAN IMPROVE STUDENT ASSESSMENT AND SUCCESS

Grajek cites two recent examples of institutions that apply analytics to improve these metrics:

- Middle Tennessee State University (MTSU) launched a predictive analytics platform a couple of years ago. Earlier this year, MTSU saw a three-percentage-point increase in first-year student retention. That increase enabled the university to achieve the highest retention rate for new freshmen in 15 years. MTSU directly attributes this achievement to the technology. (See Page 15 for more details.)
- Montgomery County (Pa.) Community College has been working on using analytics for student success for three years. The college has developed a student success network that includes a system of early alerts. Based on student performance data and various associated behaviors, the system can identify at-risk students. Advisors and students then receive alerts about actions they should take. The system includes a dashboard that students and advisors can log in to. There, they see financial aid information, the college's learning management system, assignments due, and any early alerts—all in one view.

Grajek views the use of analytics to improve student success as an *emerging* best practice.

"I think that a lot of institutions are in denial about that and they are underinvesting," she says. "My big concern is that folks often think the way to solve a challenge like this is to start with the technology. I think technology should always be in the service of strategy. Make sure that you've got the people and the process, the investment, the policies, the understanding of the outcomes you want to achieve in place before you start looking at technologies. And recognize that, because this area is still emerging, today's investments will probably have a short shelf life." ■



Business analytics tools, especially predictive analytics, provide the opportunity to monitor success indicators for individual students, instead of just aggregate metrics for all students. Leading indicators such as class attendance and LMS participation provide the opportunity for early engagement with that student to facilitate the changes necessary for student success.



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HENRY DEVRIES

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