
The Data-Enabled Executive: Using Analytics for Student Success and Sustainability



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American Council on Education
One Dupont Circle NW
Washington, DC 20036

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ACKNOWLEDGMENTS

The authors would like to thank the many individuals who helped shape this report through conversation and written review. We especially thank Molly Corbett Broad, Mark P. Becker, Stephanie A. Bond Huie, Bruce P. Szelest, and Alicia C. Dowd for their insight, expertise, and leadership. We thank all those who participated in a May 2 convening on how higher education executives could better use data to inform decision making. We extend our gratitude to colleagues Louis Soares, Lorelle L. Espinosa, Morgan Taylor, Jennifer Crandall, Elizabeth Howard, and Wei-Lin Chen for editorial support.

PREFACE

In May 2017, the American Council on Education invited over 40 higher education thought leaders, analytics experts, chief institutional research officers, chief information officers, and presidents from colleges and universities across the nation to participate in a daylong exploration of the data challenges faced by postsecondary leaders as they seek to improve student outcomes, promote equity and inclusion, and create more sustainable organizational models.

The 2017 convening saw a robust dialogue from which two primary themes emerged: 1) the presence of structural, cultural, and technical obstacles that limit the effective use of data, and 2) the growing importance of data-enabled executives and campuses. Participants expressed the importance of data-informed decision making for institutions, particularly as a variety of social, political, economic, and technological changes have converged to undermine the effectiveness of traditional higher education business models. They gave voice to some of the difficulties that emerge when institutional leaders seek to use data to monitor and track performance in a more cohesive manner. Ultimately, participants agreed that college and university leaders need to be better equipped to handle the opportunities and challenges that result from efforts to implement data analytics. The following paper, *The Data-Enabled Executive: Using Analytics for Student Success and Sustainability*, seeks to highlight what some of those needs are.

INTRODUCTION

As vital drivers of social mobility, economic growth, and community development, America's colleges and universities have long been regarded by many as the best in the world. In recognition of this, many nations have undertaken efforts to reinvent their own higher education infrastructure in ways that mirror that of the United States. So successful have these efforts been that America is no longer the most highly educated nation in the world (OECD 2016). This development has been a sobering one for lawmakers, business leaders, and the general public, who as a result have turned their attention to higher education reform. To overcome this crisis, these stakeholders have devised aspirational—and in many cases, aggressive—attainment goals collectively known as the completion agenda.

Never ones to waste a good crisis, some intrepid college and university leaders have used the completion agenda as a springboard to a new era of higher education innovation. This era of transformational change is geared toward student outcomes and marked by a focus on equity, which is particularly important given the changing makeup of the U.S. population and the collective student body. Financial realities are also shaping change efforts, as cuts in public financial support for higher education, a growing affordability gap, and the need for more extensive supports for today's incoming students make it more difficult—and expensive—to boost the number of graduates. These demographic and cost pressures have led college and university leaders to seek out evidence-based practices that are cost-effective, scalable, work for post-traditional populations, and reinforce core institutional values.

The relentless growth in the sheer volume of quantitative and qualitative data, and analysis, coupled with advancements in data governance and stewardship, are propelling improvements and innovations at some colleges and universities. For example, many institutions have used data analytics to create more personalized approaches to advising. Others have leveraged predictive analytics to estimate the likelihood of student progress through courses and majors. Some have used prescriptive analytics to combine data with teaching and advising to help improve student outcomes, particularly among underserved students. Strong leadership and a recognition of the value of data-informed decision making are often key factors in the successful implementation of analytics solutions at the campus level (Gagliardi, Parnell, and Carpenter-Hubin, forthcoming).

Like it or not, colleges and universities are facing considerable threats to their continued existence, and the pressure to use data will only grow from this point on. Leaders will need to be well versed in the opportunities and challenges of leveraging data in order to better inform business models centered on student outcomes, equity and inclusion, and optimization.

However, the use of data analytics has yet to be fully embraced by institutional leaders. According to data from the *American College President Study 2017*, only 12 percent of presidents ranked the use of institutional research and evidence among the top five areas of growing importance for presidents in the future (Gagliardi, Espinosa, Turk, and Taylor 2017). So while there are examples of colleges and universities that make advanced use of data relative to their peers, such practices need to become more widespread. Many formidable challenges must be overcome if this is to happen. At the institutional

level, data are of varied quality, and often poorly connected across important functions (e.g., finance, academic affairs, personnel, facilities), making it difficult for many institutions to analyze program and service performance relative to cost. Fears over the misuse of data have further impeded the development of analytics cultures. The upfront costs of analytics modernization efforts can be a non-starter for many senior leaders, despite potential long-term savings and revenue generation that stem in part from improved student persistence and completion. At the state and federal policy levels, data that are required for the purposes of funding allocations and accountability are often out of touch with contemporary students and institutional realities.

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To that end, this brief is intended as a primer on how to further infuse data-informed decision making into the college presidency and other senior leadership positions. It begins with a review of the need for data-informed leadership in higher education. Opportunities and challenges related to data analytics are then explored in four key areas: student outcomes, equity and inclusion, resource strategies, and infrastructure. The remainder of the brief maps key recommendations for savvy data use among senior leaders in higher education.

WHY BECOME DATA-SAVVY?

The job of leading a college or university has become harder in recent years. America's population continues to age and diversify.¹ Business leaders doubt that colleges and universities are effectively preparing graduates for jobs (Sidhu and Calderon 2014). Federal and state lawmakers have more openly scrutinized institutional performance, and a growing financial crisis undermines the sustainability of many colleges and universities (Jaschik and Lederman 2017). The convergence of these social, economic, and political headwinds have led many key stakeholders to openly question the return on investment of a higher education. Pressures have intensified and diversified as externally driven performance cultures have matured.

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Indeed, college and university leaders are confronting an increasingly volatile and pressurized environment, caused in part by an ongoing and unremitting analytics revolution. In the last two years alone, more data was created than in all of previous human history combined (IBM 2017). This includes structured data, which is well organized and easily relatable to other data, like what might be found in the Integrated Postsecondary Education Data System (IPEDS). It also includes unstructured data—which is messier, and can include data originating from sources such as networked connected devices, social media content, and business transactions. At the same time, the capacity to globally access and distribute data has quickly accelerated, which has made it so that anyone can cheaply collect, integrate, analyze, and create insight from data.

In the case of higher education, the democratization of data analytics has fueled unprecedented—and often overwhelming—demands for information (Gagliardi and Wellman 2015), which has sometimes revealed some inconvenient truths about the performance of colleges and universities. Namely, many

In the case of higher education, the democratization of data analytics has fueled unprecedented—and often overwhelming—demands for information.

¹ By the mid-2040s it is estimated that there will be no majority racial/ethnic group, and by 2060 the population ages 65 and older will more than double. Moreover, the number of U.S. high school graduates is expected to plateau, and eventually decline over the next 15 years.

institutions could do more to boost student outcomes,^{2,3} close equity gaps (Cahalan 2015; Perna 2015), and become more cost effective (Soares, Steele, and Wayt 2016; Wisconsin Hope Lab 2015). This initial surge of criticism has put many college and university leaders back on their heels, especially as demands for outcomes-based accountability have grown and traditional revenue sources have eroded. Those who have found their footing have come to realize that they too can harness the power of data-informed decision making. Many more will need to do so in order for higher education to evolve to meet contemporary demands.

USING ANALYTICS TO MODERNIZE AND SUSTAIN COLLEGES AND UNIVERSITIES

Today's highly pressurized and competitive higher education environment has made the need for a deeper commitment to data-informed decision support glaringly apparent (Swing and Ross 2016a). The way that analytics materializes on any given campus depends on a host of institutional factors (e.g., institution size, whether or not it is part of a system, human capital, financial resources). So while all colleges and universities stand to benefit from the use of data, the capacity to analyze data, create insight, and use that insight proactively differs greatly based on institutional setting.

Some institutions stand out for their use of predictive analytics⁴ to improve student outcomes; enhance and contextualize teaching, learning, and advising; and help students better choose courses and majors. Many institutions use data and analytics to hone their resource strategies, focusing on budget and enrollment. Others, especially higher education systems, have used data to address matters related to student transfer and mobility. Then there are those colleges and universities that have excelled at taking full advantage of state longitudinal data systems, as well as data from other outside sources, including federal agencies, to better understand the connections between credentials and employment outcomes.

THE CHALLENGES IN BUILDING A SMARTER CAMPUS

Regardless of a college or university's level of data analytics sophistication, all must continue to make investments in the data infrastructure and human capacity in order to:

- Improve student outcomes
- Promote equity and inclusion
- Optimize resource strategies

While institutions may differ in where they choose to focus their data analytics efforts, each of these areas influence one another.

STUDENT OUTCOMES

A majority of states have set completion goals for colleges and universities (Complete College America 2017), and most have or are implementing some form of performance-based funding tied to

2 For example, 60 percent of first-time, full-time students who began seeking a bachelor's degree at a four-year institution completed the degree at that institution by 2014. Twenty-nine percent of first-time, full-time students who began seeking a degree/certificate at a two-year institution completed within 150 percent of normal time.

3 For various reasons, which will be detailed later, these measures do not paint a clear picture of outcomes.

4 A branch of analytics that makes use of current data to forecast the future.

degree completion and job placement (Snyder 2015). The shift toward a greater emphasis on education and workforce outcomes has upset conventional funding models that were previously focused on inputs like enrollment. Because state funding—as well as tuition and financial aid policies—has primarily focused on and incentivized enrollments rather than quality completions in the past, the data and analytics infrastructures of many colleges and universities have been revealed to be misaligned with measuring progression and performance.

EQUITY AND INCLUSION

The steps being undertaken by many institutions to promote equitable access and outcomes and more inclusive environments are also key to efforts at revamping colleges and universities across the country. This has become increasingly important as the demographics of the U.S. continue to shift, and the profile of today's undergraduate students becomes more diverse in terms of age, race and ethnicity, and socioeconomic status. The way in which these students engage in and navigate higher education differs from previous generations because of their distinct learning styles, responsibilities, and experiences (Soares, Gagliardi, and Nellum 2017). Even so, traditional institutional forms and functions have been slow to keep pace with the changing face of our nation. The data infrastructures of many colleges and universities demonstrate this delayed change in microcosm—they cannot currently offer the level of disaggregation needed to help different students reach the same end goal of a high-quality education and credential.

RESOURCE STRATEGIES

Higher education data infrastructures are designed around the notion of access, and lack the level of granularity needed to promote equity and inclusion. Their configuration has implications for institutional sustainability, as well as higher education's capacity to meet key social and economic goals. The corresponding reality is that traditional funding sources, like state appropriations, federal support, and even tuition revenue have become increasingly volatile. This has led many college and university leaders to consider alternative business models, which often entails the exploration of new revenue streams and better cost structures (Soares, Steele, and Wayt 2016). For example, an increasing number of campus leaders want to develop more robust student retention and persistence strategies. However, the pursuit of more holistic resource strategies is difficult given the lack of integrated administrative and academic data. The absence of more robust and integrated data can make it difficult to identify opportunities to strategically allocate resources to courses, programs, and services that are cost-effective and scalable. This makes tough conversations about strategic investment, reinvestment, and divestment of resources in the pursuit of maintaining quality, and core institutional identity, difficult to have.

INFRASTRUCTURE

Even if college and university leaders make it a priority to better use data to help increasingly diverse populations of students succeed in more cost-effective ways, their institutions frequently lack the technical and human capital infrastructure to do so. Insufficient infrastructure can rear its head in different ways. In its most recent (2016) survey, the Higher Education Data Warehousing Forum (HEDWF) identified the following as the top five issues facing colleges and universities in their efforts to use data better: challenges related to data governance (57 percent), student success (47 percent), data quality (45 percent), metadata and data definitions (42 percent), and predictive analytics (35 percent) (Childers 2016). Other important issues identified in the survey included a business intelligence strategy (34 percent), data visualization (34 percent), and data integration (33 percent). Creating smarter campuses that focus on student outcomes, equity and inclusion, and resource strategies hinge on overcoming the aforementioned infrastructure challenges, which can be costly.

CULTURE

Still, money and technical solutions do not a data-enabled campus make; cultural and political obstacles must be addressed first. The apprehensions that come with a commitment to becoming more data-informed are potential landmines. Given that, the development of an analytics culture that is widespread and positive is one of the most important steps that can be taken to harness the analytics revolution.⁵ However, great care must be taken, as initial forays into data-informed decision making can be met with skepticism, and in some cases, great concern among faculty and administrators. Creating a sound plan for data governance is an exercise in patience, and requires that the time be spent on developing and maintaining consensus and buy-in. Such a process should not conclude with the creation of a rigid plan. Instead, it should result in a malleable framework for the definition and common use of analytics across the institution.

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The introduction of analytics also raises serious questions related to the ethics and underlying purpose of data use. To many, using predictive analytics means that students will not make their own choices, and that quality will be of secondary importance to completions. Many have grown concerned that gains in access and success will be reversed (Ekowo and Palmer 2016). Tying cost data to courses, programs, and services can lead to concerns that program and job cuts are only a few footsteps behind. Without reassurance and support, these concerns can enter the collective campus consciousness. This can cause irreparable damage to analytics efforts, and can further impede efforts at building a sustainable campus.

The development of an analytics culture that is widespread and positive is one of the most important steps that can be taken to harness the analytics revolution.

Viewed individually, data challenges related to student outcomes, equity and inclusion, resource strategies, infrastructure, or culture would represent a formidable obstacle for any president seeking a data-enabled campus. All too often, however, all are present in some form at any given institution. The convergence of these challenges creates a “black box” of data that makes the reform efforts of college and university leaders exceedingly difficult (Soares, Steele, and Wayt 2016). This may help to explain why few institutional leaders believe they have sufficient access to data and resources to analyze and use to make better decisions (McGuirt, Gagnon, and Meyer 2015). In a recent KPMG survey, only 29

⁵ In the HEDWF survey, a data-informed culture was chosen by 35 percent of respondents as a top area of importance (Childers 2016).

percent of college and university leaders responded that they were using data to inform decision making.⁶ The reality is that many—if not most—colleges and universities have just started their analytics journeys.

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As analytics functions evolve amid accelerating demands for data and insight, campus stakeholders are increasingly using data to conduct their own analysis, rather than using conventional functions like institutional research to do so. For example, student affairs divisions are using quantitative and qualitative data that they collect—and that nearly half of IR offices have no access to—in order to help students (Parnell, forthcoming; Swing, Jones, and Ross 2016). As such, institutional research is being reshaped by the ongoing analytics revolution (Gagliardi, Parnell, and Carpenter-Hubin, forthcoming). In recognition of this, the Association of Institutional Research (AIR) has issued a statement of aspirational practice for its membership. The statement focuses on a hybrid model of institutional research that focuses on empowering students, faculty, staff, and leadership to engage in data-informed decision making (Swing and Ross 2016b). Some of the keys to modernizing the structures and leadership for institutional research include:

- Activating a networked institutional research function
- Leveraging institutional research as a teacher of data and analytics good practices
- Providing data and analytics tools that activate data-informed decision making
- Offering campus-wide professional development of data-related skills and competencies
- Focusing on the student

Taken together, these aspirational practices provide senior leaders with a framework for data use and a blueprint for creating a campus-wide analytics culture. The following promising practices highlight how some colleges and universities have successfully embraced the ongoing analytics revolution.

PROMISING PRACTICES

Regardless of where any given campus is situated on the road to becoming data-savvy, quick wins can be had without all the bells and whistles of a 100-factor algorithm. In fact, many of the campuses held up as exemplars for their analytics sophistication started modestly, and began by using analyses that examined retention, progression, credit accumulation, bottleneck courses, developmental coursework,

⁶ Forty-one percent of colleges and universities reported using data for forecasting and predictive analytics. Only slightly more than half used data and analytics for the purposes of supporting budgeting and enrollment. Fewer than half of institutions use data analytics to support fundraising, and only a third use data to support supply chain optimization.

completion rates, excess credits, and degree pathways (Yeado et al. 2014). Key to their efforts were strong leadership, clear goals, routinized use of data, a culture of inquiry, and a willingness to change. The following are examples of institutions and systems that are leveraging data in novel and effective ways.

STUDENT OUTCOMES: UT SYSTEM

Recently, The University of Texas System created a dashboard (UT System 2015) for the purposes of accountability, transparency, and performance improvement. The dashboard uses business intelligence software to mine and analyze data, providing senior leaders with insight related to student success, research, health care, state economic impact, and post-graduation outcomes and earnings.

In 2014, stemming from the findings of the Student Debt Reduction Task Force, the system became the first in the nation to launch an interactive website that provides post-graduation salary and debt data of The University of Texas System graduates. The dashboard, called seekUT, initially contained insights such as:

- Median earnings for graduates one and five years after receiving a degree
- Average student loan debt
- Percentage of graduates who elect to continue their education
- Number of semester credit hours required to earn a bachelor's degree
- Labor market projections by occupation and region

Building on that success, The University of Texas System has created a first-of-its-kind collaboration with the U.S. Census Bureau to integrate data from the Longitudinal Employer-Household Dynamics (LEHD) program into their analytics platforms. As a result, The University of Texas System is distinct in its ability to provide valuable information about post-graduate outcomes for UT system students living across the U.S. (UT System 2016).

EQUITY AND INCLUSION: GEORGIA STATE UNIVERSITY

Georgia State University (GSU) has increased its six-year graduation rate by over 20 percent, and doubled its number of Pell-eligible students over the course of the last decade. The institution may have first received wide acclaim in 2012 for its implementation of the graduation and progression system (GPS) advising tool, which uses big data mining techniques to provide students with academic guidance, but the reality is that GSU began its data-informed student success efforts more than a decade earlier (Kurzweil and Wu 2015). Kurzweil and Wu (2015) identified the following key factors to GSU's evolution into a data-savvy institution:

- A systematic approach to problem solving
- A comprehensive data warehouse or comprehensive data warehouses
- A cross-functional organizational structure
- A commitment to the success of underserved students
- A demonstration of support for and long-term commitment to data analysis from university leadership

GSU's efforts, which have included freshman learning communities, supplemental instruction, retention grants, and the GPS system, have saved students an estimated \$12 million in tuition by accelerating graduation. The university has also eliminated graduation rate gaps for low-income, first-generation, and minority students.

RESOURCE STRATEGIES: DELAWARE COST STUDY

Since its inception in 1992, over 700 institutions have participated in the Delaware Cost Study. The study is one of the few in higher education that integrates data related both to cost and budget, and to teaching and scholarly activity. Administered by the University of Delaware Office of Institutional Research and Effectiveness, the Delaware Cost Study is the only national study of its kind. The study aims to provide a comparative analysis of faculty teaching loads, direct instructional costs, and separately budgeted scholarly activity within a given discipline (Higher Education Consortia 2016). Some of the metrics provided by the Delaware Cost Study include:

- Undergraduate and graduate student credit hours taught per FTE faculty
- Total organized class sections taught per FTE faculty
- FTE students taught per FTE faculty
- Instruction-level metrics based on division and undergraduate/graduate level
- Direct instructional expenses per student credit hour taught
- Direct instructional expense per FTE student taught
- Separately budgeted research and service expenditures per FTE tenured and tenure-track faculty (Rosowsky and Ryan 2013)

As a growing number of institutions face looming financial realities, frameworks and metrics such as those provided by the Delaware Cost Study will provide insight that will allow institutions to make strategic investments into programs based on performance and costs. This focus on sustainability will be crucial moving forward.

INFRASTRUCTURE: STATEWIDE LONGITUDINAL DATA SYSTEMS

Since 2005, the Institute of Education Sciences (IES) has awarded competitive, cooperative agreement grants to build Statewide Longitudinal Data Systems (SLDS). The purpose of the SLDS has been to help and design, build, and expand early learning through workforce data systems. These systems are intended to help states leverage data, including individual student records, to improve student outcomes, close equity gaps, and promote better decisions. As a result of six rounds of funding, 47 states, the District of Columbia, Puerto Rico, the Virgin Islands, and American Samoa have received at least one SLDS grant (National Center for Education Statistics 2017a).

These data systems have been used to great effect. For example, the Kentucky Center for Education and Workforce Statistics (KCEWS) has received five rounds of funding (2006, 2009, 2012, and 2015) totaling nearly \$19 million (National Center for Education Statistics 2017b). Since receiving its first

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grant, KCEWS has evolved significantly. What began as an effort to create a data warehouse with longitudinal tracking capabilities is now turning into a dynamic reporting solution that allows for the creation of core analytics products. These products include general feedback reports that address the needs of key stakeholders, as well as more customizable self-service models which allow users to tailor analytics products based on role and context. SLDS represent an enormous opportunity to capture and analyze data in a smarter way. Colleges and universities should take full advantage of these existing data systems by using the more granular and comprehensive data within them to boost performance in an equitable and sustainable fashion.

CREATING A DATA-ENABLED EXECUTIVE

These practices offer examples illustrating how the analytics revolution has begun to take root in higher education, giving hope to many college and university presidents who are facing mounting accountability and performance pressures. Still, the analytics revolution is not the panacea some believe it to be. Being analytically robust is currently out of the reach of many colleges and universities for a host of reasons, some technical and others not. College and university presidents face diverse demands, making it virtually impossible to have the time to develop deep understanding of data analytics. In turn, many presidents need someone close to them with the resources, knowledge, and time to inform them in key areas, including a) improving student outcomes, b) promoting equity and inclusion, and c) using integrated academic, personnel, service, and budget data to improve productivity. Understanding these key areas forms the basis of data-enabled executives who use evidence to inform decisions on increasing institutional performance and productivity.

IMPROVING STUDENT OUTCOMES

Data play an integral role in the creation of institutional practices to improve student outcomes. However, a host of challenges exists around the use of data to help facilitate completion and post-graduate success, such as:

- **Key stakeholders lack access to data that paint a more complete picture of the academic and nonacademic experiences and career outcomes of students.** Within institutions, data from various units remain disconnected, and many institutions still lack the resources to use data from state longitudinal data systems and state agencies.
- **Even if there is access to such data, it is not universally understood what the data mean.** While efforts have been undertaken to streamline the understanding of data within and across sectors, the work remains incomplete.
- **Insight must be better communicated, particularly as data become more public and accountability pressures increase.** Clearly, simply, and effectively communicating insight to diverse stakeholders can be tough, as good analysis and communications skills are not always developed in tandem.
- **Creating cross-functional teams can help better communicate insight to senior leaders.** The application of diverse perspectives and skillsets can help extract the most value from data and insight in ways that facilitate action.

PROMOTING EQUITY AND INCLUSION

Closing equity gaps and creating inclusive environments for all students regardless of race and ethnicity, socioeconomic status, age, sexual orientation, and gender is no easy task, but data can be helpful in doing so.

While big data and quantitative analysis are useful in uncovering the “what,” qualitative data are needed to truly understand the “why.” Both forms of data are equally important.

- **At the campus level, focusing on the individual student can humanize data, and promote more student-centered data use.** In leaving data at the aggregate level, administrators, faculty, and support staff can forget that there are real people behind numbers. Focusing on the individual can help prevent that, while also revealing meaningful differences.
- **Avoid the perverse consequences of well-intentioned data use.** More institutions are using data to predict student performance in order to prescribe specific pathways and supports. Doing so can mutually benefit the student and the institution, but it can also be detrimental to students who are deemed “at risk.” This can actually limit access and success rather than promote it.
- **Use quantitative data and qualitative data in complementary fashion.** While big data and quantitative analysis are useful in uncovering the “what,” qualitative data are needed to truly understand the “why.” Both forms of data are equally important.
- **Realize that in uncovering disparities between student groups, the institution needs to be fixed, not the student.** If the success of a specific student population is persistently low, there are likely systemic institutional problems present that require confrontation and reconfiguration.
- **Address needed structural changes in curriculum and delivery models.** By using data to identify bottlenecks, campus leaders can reduce barriers for students who struggle rather than directing students to another area of study or institution.

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USING FINANCE DATA TO IMPROVE PRODUCTIVITY

Financial pressures make it difficult to invest adequate resources into the services that promote student success, but which are also cost-effective and scalable. Using data to identify academic programs and student services that facilitate student success will grow in importance as more campuses face financial challenges.

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- **Pressures to illustrate return on investment are growing while resources are becoming unstable.** Leveraging historical data on programs, services, and facilities can paint a more accurate picture of their productivity.
- **Difficult conversations about strategic investment into academic programs and student services require robust financial analysis.** As more campuses face the reality that departments may need restructuring, and that services that boost student success may be unscalable, stakeholders need to see the data in order to have difficult conversations and avoid entrenchment.
- **Financial insight can identify revenue centers and cost centers, but following such data blindly can mask programs and services that are core to institutional identity and mission.** Cost centers should not necessarily be downsized or cut, particularly if they are integral to the distinct identity and mission of a specific campus.
- **By reinvesting into programs that are core to institutional identity, and which are also cost effective and student-success friendly, an institution can become more viable.** Short-term belt-tightening can lead to long-term growth. Communicating that effectively is key to efforts at optimization.

CONCLUSION

Colleges and universities have begun to embrace the analytics revolution, but more must be done in order for it to firmly take root. The benefits of modernizing analytics are manifold, and include equitable access and outcomes, and more sustainable and inclusive campuses. To reap those benefits, a few things must first happen. Data governance and stewardship practices must be strong in order to ensure that data are of quality and secure, and that data use is ethical. Cross-functional data should be integrated so that individual faculty, staff, and administrators can assess the effectiveness of various courses, programs, and services. This requires a common language and standard definitions around data, in addition to strong infrastructure and platforms that make data accessible and give it utility. Partnerships between institutions, state longitudinal data systems, or state agencies should be pursued (where they have not been already) despite apprehension of potentially difficult and time-consuming legal wrangling. A campus-wide culture that embraces quantitative and qualitative data must be nurtured, so as to alleviate concerns about the intent behind becoming more data-informed. Offices such as institutional research and information technology should be given the resources to lead efforts to create and diffuse that culture while also managing a growing number of data consumers and demands, rather than being pitted against one another for turf and scarcer resources.

There is no way around it: the path to becoming a data-enabled executive has many twists and turns. Data-enabled higher education executives prioritize the creation of a campus-wide analytics culture focused on the use of data to promote equity and inclusion, improve student outcomes, develop more inclusive environments, and create more holistic resource strategies. They also create the commitment and buy-in necessary to develop the required technical infrastructure and human capacities needed to use data wisely to enhance teaching, learning, and advising.

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