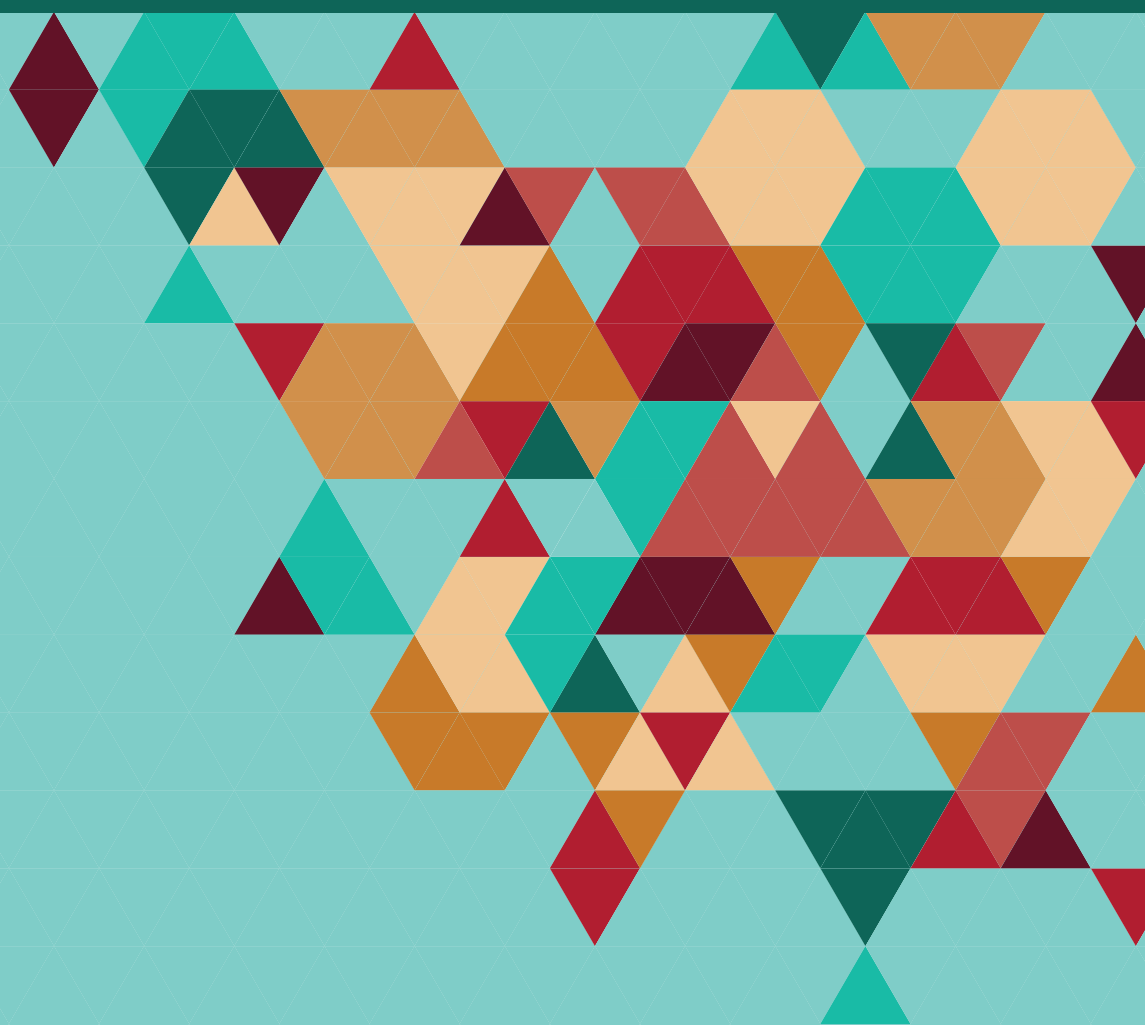


The Analytics Landscape in Higher Education, 2015



Contents

Executive Summary	3
Key Findings	4
Introduction	5
Defining Analytics	6
Analytics and the Institution	7
Data Collection and Use	14
Technology and Infrastructure	21
Concerns and Challenges	22
Analytics Maturity	25
Recommendations	30
Methodology	32
Acknowledgments	33

Author

Ronald Yanosky, Consultant, with Pam Arroway, EDUCAUSE

Citation

Yanosky, Ronald, with Pam Arroway. *The Analytics Landscape in Higher Education*, 2015. Louisville, CO: ECAR, October 2015.

©2015 EDUCAUSE. CC by-nc-nd.

EDUCAUSE

EDUCAUSE is a nonprofit association and the foremost community of IT leaders and professionals committed to advancing higher education. EDUCAUSE programs and services are focused on analysis, advocacy, community building, professional development, and knowledge creation because IT plays a transformative role in higher education. EDUCAUSE supports those who lead, manage, and use information technology through a comprehensive range of resources and activities. For more information, visit <http://www.educause.edu>.

Executive Summary

With this report, the EDUCAUSE Center for Analysis and Research updates an inquiry it first launched in 2012. Analytics—the use of data, statistical analysis, and explanatory and predictive models to gain insight and act on complex issues—remains today, as we found it then, a matter of keen interest among college and university leaders. Nine out of 10 respondents report some level of institutional interest in analytics. Executive sponsorship and support are widespread, and many institutions are planning or considering enhancements to their analytics capabilities.

Yet it is easier to find consistencies with our earlier results than signs of progress. The predictive or proactive modes of analysis that distinguish analytics from traditional reporting remain about as common as they were three years ago—that is, not very common. For the most part, analytics data continue to be used for operational monitoring, and often they are collected but rarely used or never used at all. Analytics maturity among respondents to the 2014 EDUCAUSE Core Data Service closely resembles the levels measured in our 2012 study. Affordability remains the top concern today, as it was then.

Our new study permits us to look at analytics investment and use in greater detail than we could before. By many measures, institutional analytics (intended to improve services or business practices) dominates over learning analytics (intended to enhance or improve student success). Institutional analytics is twice as likely to be described as a major priority than is learning analytics. Similarly, 37% of respondents say their institution makes major investments in institutional analytics, but only 18% say so for learning analytics. Most institutions lack dedicated analytics leadership, but where it exists it is more common for institutional than learning analytics. This is especially noteworthy because dedicated leadership is associated with higher analytics maturity. Institutions are planning or considering new analytics uses across a broad spectrum, but not in ways that suggest learning analytics is gaining. At the same time, there is overlap in the motivations driving each kind of analytics, suggesting that there is some complementarity between the two modes and that investments in one may provide returns in the other.

What can institutions do to improve their analytics game? First, define the strategic needs and priorities that you expect analytics to address, and set analytics priorities accordingly. We also advise participating in the annual EDUCAUSE Core Data Service (CDS)—which includes the EDUCAUSE analytics maturity index—to assess institutional strengths and weaknesses and to identify the investments that will have the most impact. Finding resources for analytics is tough in a perennially underfunded environment, but we can't help notice that, in the midst of frozen analytics progress, investment/resources remains the least developed dimension of analytics maturity. Institutions that want to bring increasingly powerful analytics tools to bear on strategic challenges will have to build the case for investment.

Key Findings

- Despite widespread interest, analytics is still not regarded as a major institutional priority at most institutions. Investment is more often described as minor rather than major. Institutions where analytics is a major priority are more likely to report a major investment in it.
- Reporting prevails at most institutions over more advanced analytics-based projections and proactive responses, a pattern that has not changed since 2012.
- Institutional analytics tends to enjoy higher priority—and higher levels of investment—than learning analytics. Four in 10 institutions report little or no investment in learning analytics. Overlap in motivations driving both types of analytics, however, suggests that investments in one area may produce returns affecting both.
- Most institutions do not have a dedicated leader for either institutional or learning analytics, but involvement by presidents and chief academic officers (CAOs) in leading or sponsoring analytics is widespread. Chief financial officers are somewhat less involved than these executive peers. Top analytics influencers are the CIO, director of institutional research (IR), and CAO.
- Notwithstanding disparities in priority and investment, institutional and learning analytics are about equally represented among the most common areas of analytics use.
- Planned new uses of analytics generally favor institutional rather than learning analytics, but institutions are adding to capabilities across a wide spectrum of areas.
- Analytics maturity did not change significantly between 2012 and 2014. Investment/resources, which includes financial resources and staffing, continues to be the area with lowest maturity.

Introduction

Three years ago, the EDUCAUSE Center for Analysis and Research (ECAR) opened its report on analytics in higher education by describing analytics as a “hot topic.”¹ Since then, the temperature has remained distinctly warm, if somewhat variable. Analytics issues made up four of the EDUCAUSE Top 10 Strategic Technologies in 2014 and two of them in 2015.² The forces driving analytics interest remain potent: pressure to find new students, meet accreditation requirements, respond to performance-based funding formulas, improve student success, and take advantage of a gusher of educational “big data.” The centrality of analytics to so many key higher education interests led us to reopen our inquiry in 2015.

This study refreshes much of our earlier work, while adding new analytics issues that have emerged since then. As in 2012, we have gauged the state of analytics both through survey responses from EDUCAUSE member institutions and with qualitative input from focus groups and subject matter experts. Our survey was directed at each institution’s primary EDUCAUSE representative, usually the CIO. Focus group participants included leadership and professionals from the information technology (IT), IR, dedicated analytics, and business and finance units. (See “Methodology” for more details.) Key interests we’ve carried over from three years ago include how analytics is being used, who has responsibility for it, and what concerns and challenges arise from its use.

Our purposes have also evolved. Recognizing that an area once seen as “business intelligence” has broadened beyond business and administrative concerns, we’ve added a new distinction between institutional and learning analytics. We’ve collected new information about staffing and future analytics plans, and assessed trends in analytics maturity using the maturity index that we developed in 2012 and later revised and incorporated into the 2014 EDUCAUSE Core Data Service (CDS) survey. The [CDS survey](#) collects a wide variety of information about the institutional IT environment and feeds a benchmarking service that colleges and universities use to inform their IT strategic planning and management. In this report, the 2014 CDS data supplement information gathered in the 2015 analytics survey.

Though we have much new to say, one unfortunate continuity from 2012 will become clear: Institutions are still struggling to realize the potential of analytics and to find the resources necessary for its optimal use. We hope that this report helps colleges and universities better appreciate where they stand in the evolving analytics landscape and better understand what they can do to move forward.

Defining Analytics

We define “analytics” as *the use of data, statistical analysis, and explanatory and predictive models to gain insight and act on complex issues*. It’s important to note that our definition, developed originally for our 2012 study, goes beyond traditional reporting to emphasize prediction and action. As we wrote in 2012, “analytics is not the end goal. Rather, analytics is a tool used in addressing strategic problems or questions.”

With this in mind, we refined the focus of our 2015 investigation to distinguish between two different applications of analytics, each addressing a major strategic domain:

- **Learning analytics**, intended to enhance or improve student success; and
- **Institutional analytics**, intended to improve services and business practices across the institution.

Where we refer to analytics without specifying one of these domains, we mean the full range of capabilities encompassing both areas.

Analytics and the Institution

Priority of Analytics

In 2012, respondents overwhelmingly believed that analytics would become more important to higher education in the next two years, just as it had already become more important in the previous two. Yet only 28% of those respondents described analytics as a major institutional priority.

If rising priority indicates greater importance, those 2012 predictions have been at least partially vindicated. In 2015, 47% of respondents said institutional analytics was a major priority, but only half as many described learning analytics as one (figure 1). Most of the difference between the two modes is accounted for by the greater number who saw learning analytics as an institutional *interest* but not a priority. Less common but still striking in its contrast is lack of interest altogether: Compared to institutional analytics, respondents were three times as likely to see learning analytics as neither an interest nor a priority.

47%

of 2015 respondents said institutional analytics was a major priority, but only half as many described learning analytics as one

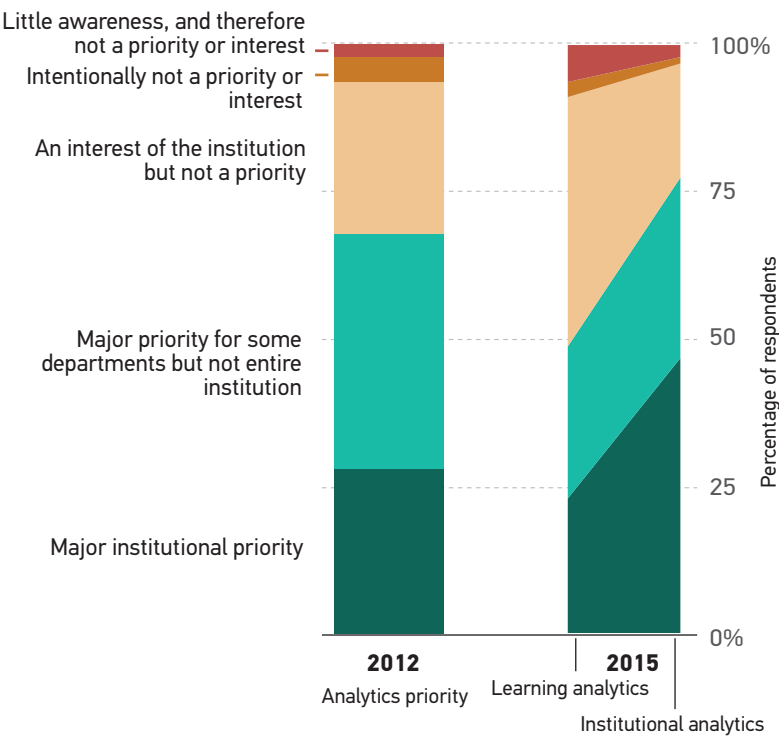


Figure 1. Priority of analytics

We found no significant differences in analytics priority based on Carnegie class or institutional size, nor any exceptions to the pattern of greater priority for institutional analytics than learning analytics. Focus groups did not explicitly describe institutional analytics as a higher priority, but they did report a mixed pattern of commitments. Where analytics had caught hold, focus group members mentioned the influence of analytics-oriented leadership, incorporation of measurement into strategic planning, accreditation pressures, recruitment needs, and student success concerns.

Investment

The same contrast observed in priority appeared in analytics investment. Most institutions make at least minor investments in analytics of both kinds (figure 2), but many more reported a major investment in institutional analytics (37%) than in learning analytics (18%). Four in 10 reported little or no investment in learning analytics, twice the rate for institutional analytics. Not surprisingly, institutions assigning major priority to either kind of analytics are more likely to make major investments in it.

“The enrollment side is more mature than the educational side.”

— ECAR focus group participant

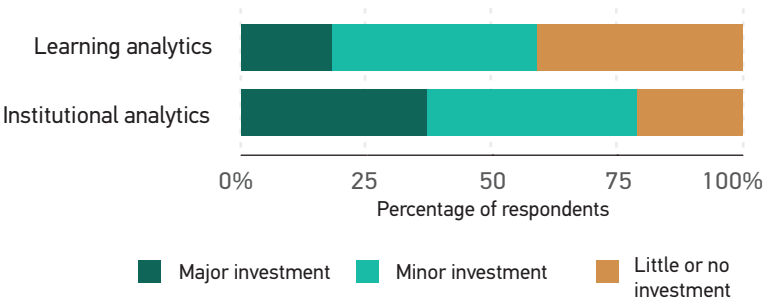


Figure 2. Analytics investment

What motivates institutions to invest in analytics? Improving retention and demonstrating higher education’s effectiveness ranked among the top 3 motivators for both learning and institutional analytics (figure 3). This motivational overlap suggests that there is some complementarity between the two modes of analytics and that investments in one may provide returns in the other (see sidebar “Shared Investments and Shared Success”). Still, there are noteworthy contrasts between the modes of analytics, and no single motivator was chosen by a majority of respondents for either mode. Among learning analytics motivations, improving retention dominates. There is a 15-point gap between the number of those naming retention as a top-3 motivator (34%) and the next most commonly identified motivators (improving student course-level performance, demonstrating higher education effectiveness, and reducing time to degree, all 19%). Top motivations for institutional analytics were a bit more diverse: Optimizing resources stands at the top (31%), followed by demonstrating higher education effectiveness (27%), improving retention (25%), and reducing costs (22%).

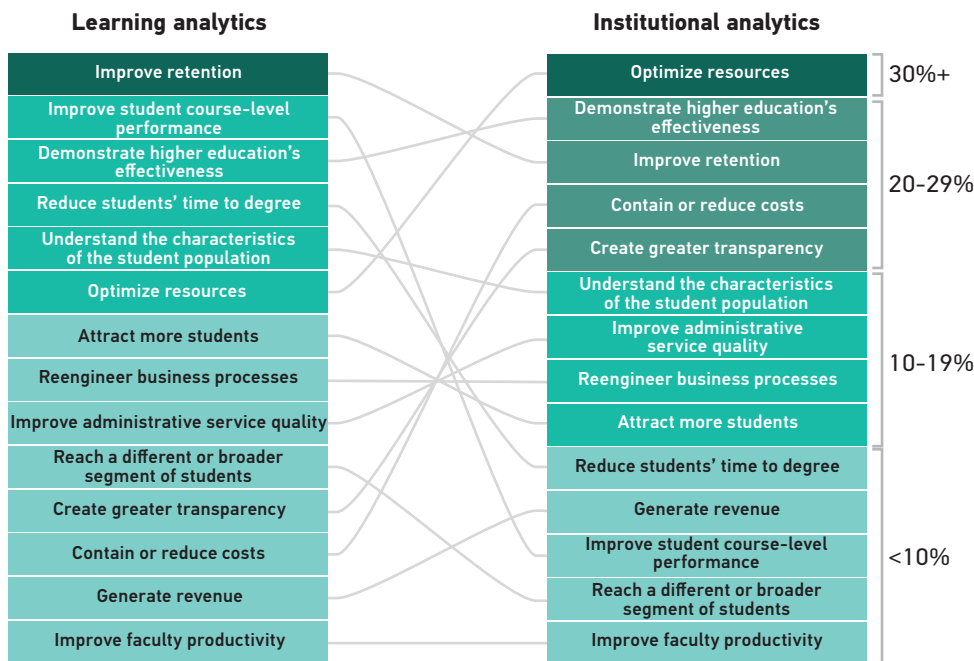


Figure 3. Motivation for investing in analytics

Shared Investments and Shared Success

Institutional interests in optimizing business practices and operational efficiencies are driving analytics maturity in higher education more than interests in improving student outcomes. However, it is important to note that these drivers are not necessarily mutually exclusive. Improving student retention, reducing students' time to degree, and improving student course-level performance (and therefore reducing remediation or dropout) are good business practices that also directly support student success. The lines between institutional analytics and learning analytics blur in these areas. Regardless of the motivation to invest in these factors, the return on that investment will be seen by those interested in improving the business model and by those interested in improving student outcomes.

Institutions won't likely find a "quick win" when it comes to learning analytics investments since measuring success metrics for student outcomes requires end-of-course, end-of-term, end-of-year, or end-of-matriculation assessment periods. Chief business officers (CBOs), CAOs, CIOs, and institutional research professionals, however, will enjoy the shared success of the initial investment in these areas.

As we note in more detail below ("Analytics Maturity"), EDUCAUSE has identified investment/resources as one of the six dimensions of analytics maturity, and data consistently show investment/resources as the least mature analytics dimension and a drag on overall maturity. Analytics improvement isn't likely to happen without commensurate investment. These modest (and in some cases nonexistent) investment levels are worrisome for anyone who hopes to see higher education improve its analytics game.

Responsibility for Analytics

Analytics services are most often delivered as a joint program run by IR and IT (figure 4). Where they are not, they are most often run by IR, followed by IT. Placing responsibility in dedicated analytics centers is rare, and where it is done, IR and/or IT are usually included. These patterns of analytics responsibility haven’t changed much since 2012.

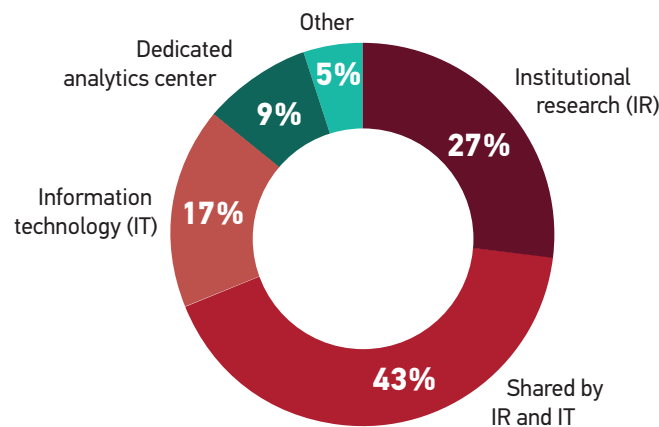


Figure 4. Responsibility for analytics services

None of our focus group participants questioned that IT has an important role in analytics, but they were divided about whether it should lead. Those in the pro camp argued that IT’s broad presence means it can best assemble necessary partnerships: “IT has a general level of institutional knowledge that nobody else will have.” Similarly, some thought IT best understands how to define and collect data for general rather than local use, “putting controls in place at the front instead of Band-Aids at the end.”

But others argued that IT should restrict itself to a supporting role. IT can contribute “tool knowledge” and data models, these participants said, but can go only so far in getting the institution to act. “You really need the deans, the chairs, the VPs pushing this,” one said. Agreeing, another said that “IT should never be the people who are trying to make [analytics] decisions.”

Leadership

Most institutions lack a dedicated leader for either type of analytics, but among those that have one, a leader for institutional analytics is more common (37%) than one for learning analytics (19%). Both roles are more likely to exist among institutions making major investments in analytics and at institutions where the president plays a lead or support role in analytics. Having an institutional analytics leader may set the stage for creating one in learning analytics: Those with the former are three times as likely to have the latter. Where both roles exist, about half the time they are held by the same person, most often the director of IR.

To say that most institutions lack dedicated analytics leadership is not to say that institutional leadership is uninvolved. More than 6 in 10 2014 CDS respondents agreed that their institutional leadership was publicly committed to the use of analytics and data-driven decision making. Our 2015 analytics survey respondents confirmed this picture of widespread executive involvement (figure 5). Presidents frequently serve as analytics leaders or sponsors, though more often for institutional analytics (51%) than learning analytics (37%). Not surprisingly, CAOs tend the other way—55% lead or sponsor learning analytics, 45% institutional analytics. Both presidents and CAOs also frequently act in a support role. Less intuitively, chief financial officers (CFOs) only play a leadership or sponsorship role in institutional analytics at about a third of institutions, though they more often have a supporting role.

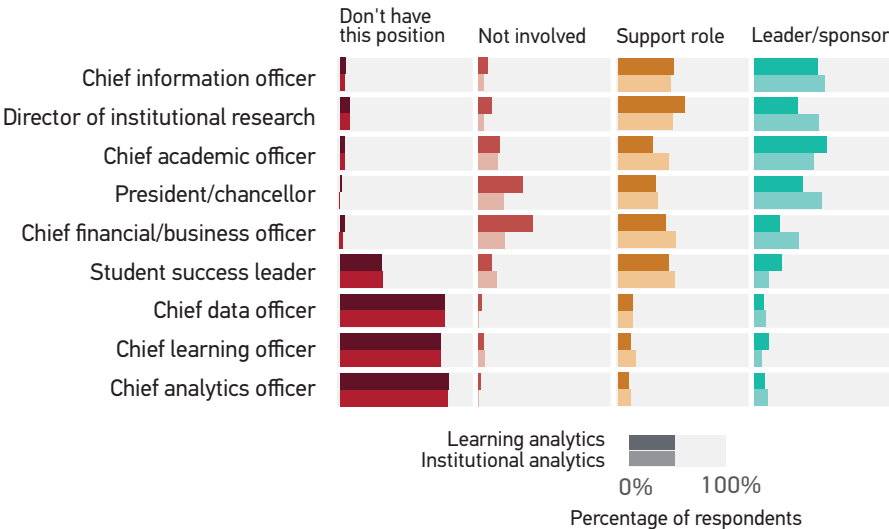


Figure 5. Leadership roles in analytics

When support and leadership/sponsorship roles are combined, the top influencers for institutional and learning analytics alike are the CIO, director of IR, and CAO. These positions support or lead both forms of analytics at more than 8 in 10 institutions. The president and chief financial officer lag only slightly behind these for institutional analytics but more so for learning analytics. Given their self-described prominence in analytics leadership and support, IT leaders should do their best to ensure that the right people are sitting at the analytics table and invested in the discussion.

There is reason to believe that executive participation helps promote an effective analytics capability. Focus group participants noted that top leadership often drives analytics adoption, especially by incorporating it into the strategic planning process and by bringing it to bear on such high-level issues as enrollment management and performance-based funding. Leadership commitment is a contributing factor to analytics maturity, and among our survey respondents, involvement of the president in an analytics leadership or support role is associated with higher priority of both institutional and learning analytics.

Involvement of the president in an analytics leadership or support role is associated with higher priority of both institutional and learning analytics

Data Collection and Use

Where Analytics Data Come From

Information-hungry institutions collect analytics information from an extraordinary variety of sources. Of 16 kinds of information systems that we asked about, each was used by a large majority of respondents to collect analytics data (figure 6).

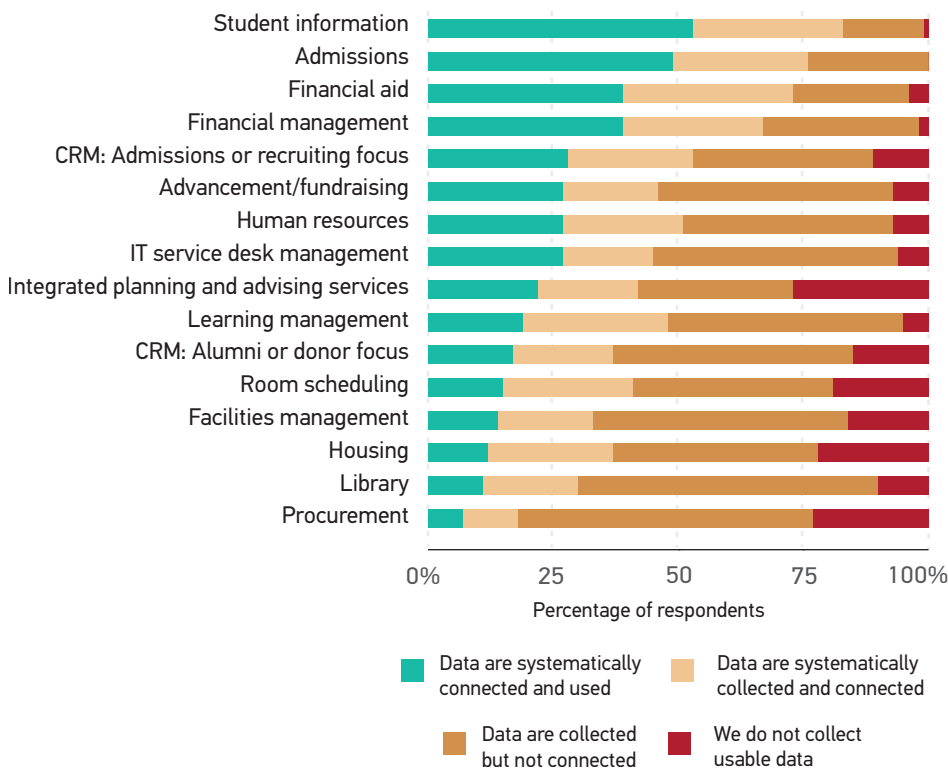


Figure 6. Analytics data collection and use

Not all data collection is equal, however. Data gain much of their explanatory power by being integrated or connected with other data, and by being used systematically in analysis. But often, analytical opportunities are lost for lack of these actions. For most of the systems we asked about, the predominant mode of data gathering was “collected but not connected,” and for only two—the student information system and admissions—did as many as half of institutions say data are systematically connected and used. These results suggest that institutions struggle to get optimal analytical use out of the data that are available and also support the conclusion of a recent EDUCAUSE report that “higher education is data rich but information poor.”³ As one focus group respondent complained, “the difference between what we’re collecting and what we’re reporting on is huge.”

We also found signs of the familiar dichotomy between institutional and learning analytics. The top 4 systems contributing data that are used systematically all had a strong administrative or business orientation mostly relevant to institutional analytics, though they may contribute learning data as well. Systems with a strong learning orientation, such as learning management or integrated planning and advising services systems, fell into the middle of the systematic use range. Integrated planning and advising services systems had the highest rate of noncollection among all the systems we asked about. This may be due to product immaturity or lack of experience with these relatively new systems.

For most systems, the predominant mode of data gathering was “collected but not connected,” and for only two systems did half or more institutions say data are systematically connected and used

Modes of Data Use

We asked about the modes in which data are used in assorted functional areas (figure 7). As in 2012, monitoring of operations in 2015 predominated over more advanced modes (such as making projections or triggering proactive responses) that fulfill the EDUCAUSE definition of analytics. Also as in 2012, the areas where advanced analytics were most commonly used were enrollment management, undergraduate student progress, and finance and budgeting. Even in these areas, the use of analytics to make projections dominates over proactive, event-triggered responses.

As in 2012, monitoring of operations in 2015 predominated over more advanced analytical modes that fulfill the EDUCAUSE definition of analytics

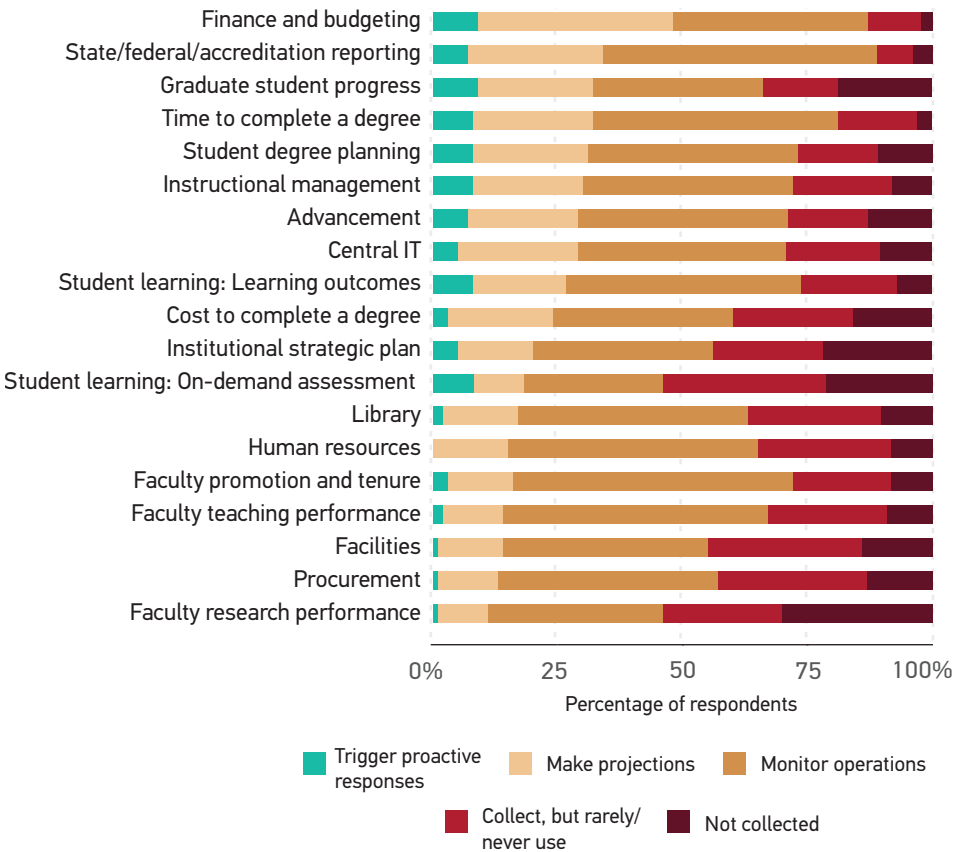


Figure 7. Modes of data use

Focus group members were generally sold on the value of more advanced modes of analytics. One participant’s institution had driven its tuition discount rate down nine points through predictive analytics. Others looked for benefits in student success uses such as academic early-warning systems and advising. Participants were frustrated, however, at slow progress and the dominance of traditional history-based reporting. One expressing the same thought as many others lamented, “Right now, we drive with the rear-view mirror, looking back.”

Analytics Current and Planned Use

In addition to investigating the analytical modes applied to data, we asked about the extent of current use and future plans for analytics in a variety of functional areas (figure 8). The stark fact is that for most functions we asked about, analytics is not currently used at most institutions. Where it is used, it often is only sparsely applied.

“We say we’re doing analytics, but all we’re really doing is running the same enrollment reports and then some retention reports.”

—ECAR focus group member

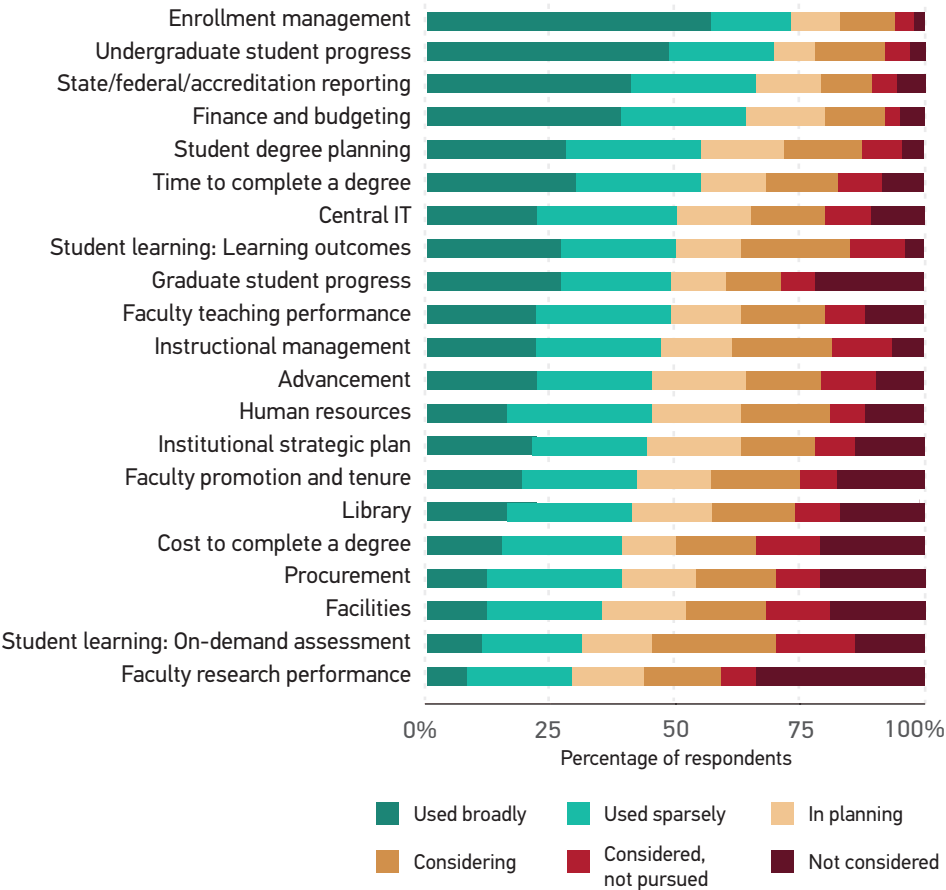


Figure 8. Analytics current and planned use

Enrollment management is the only area where a majority of respondents reported broad use, and in just seven other areas did a majority of respondents report any current use. In a departure from the imbalance we've noted elsewhere, these majority-use areas reflect institutional and learning analytics-related functions roughly equally, in part because they are heavy on functions like enrollment management that involve both modes of analytics. Most of the top 8 also correspond to the top areas for use of advanced analytical modes, suggesting that breadth and sophistication of use go hand in hand.

As we note below, affordability was at the top of respondent concerns about the use of analytics, and issues around misuse or inaccuracy of data ranked high as well (see "Concerns and Challenges.") We suspect that obstacles like these, rather than lack of desire to apply analytics, account for much of the nonuse we found, especially considering that many institutions are planning or considering new uses. Focus groups suggested as well that there may be constituent resistance to applying analytics, based on fears that data don't accurately reflect a complex situation or could threaten existing programs or prerogatives.

Among new analytics capabilities being added, the areas with the largest "in planning" rates (advancement, institutional strategic plan, human resources, and facilities) generally have an institutional analytics emphasis. The same is true for relative change: Areas where "in planning" rates imply the biggest growth from current use include one learning function (on-demand student learning assessment) but otherwise are dominated by institutional analytics applications. Learning analytics does a little better in the more speculative category of considering or experimenting with new uses, but on the whole there is no clear evidence that learning analytics uses are gaining on those of institutional analytics.

Ranking new uses in this way, however, obscures a more fundamental point. New uses "in planning" are reported at remarkably consistent rates across functional areas, ranging in every case between 9% and 19%. When these are added to uses that are under consideration, there are 15 different functional areas in which 30% to 40% of institutions reported new uses in play. Judging from these results, new analytics uses are being added on a broad and diverse front.

For most functions we asked about, analytics is not currently used at most institutions, and where it is used, it is often sparsely applied

Staffing

Staffing levels dedicated to providing analytics services and support vary significantly by institution size and type. Staffing rises with enrollment, but not proportionately: Institutions with fewer than 2,000 students reported a median 2.0 analytics FTEs, while those in the 4,000–7,999 range reported twice as many, and those with 15,000 or more have a median 8.5. Not surprisingly, doctorals have the largest staffs, and AA and BA institutions the smallest. Staff are most commonly found in IR, followed by IT and administrative units.

One thing that doesn't vary much is conviction that more analytics staff FTEs are needed. Asked how many additional FTEs they would need to optimally provide analytics services and support, institutions in every size range named significant increases, from 59% (based on medians) among institutions of 15,000 or more students to 100% among those with fewer than 2,000.

What roles do analytics staff perform, and where is more help needed? We asked which types of staff functions institutions had in place and whether they needed more in each. As figure 9 shows, the top functions needed are in predictive modeling (92% of institutions), analytics tool training (89%), data visualization (88%), user experience development, and data analysis (both 87%). All of these except data analysis are currently in place at fewer than 6 in 10 institutions. The near-universal desire to add predictive modeling skills indicates a wish to move from a reporting orientation to a higher order of understanding and action.

"You have to hire a storyteller."

"We often try to build things with one person, when it probably should be more than one person."

—ECAR focus group members

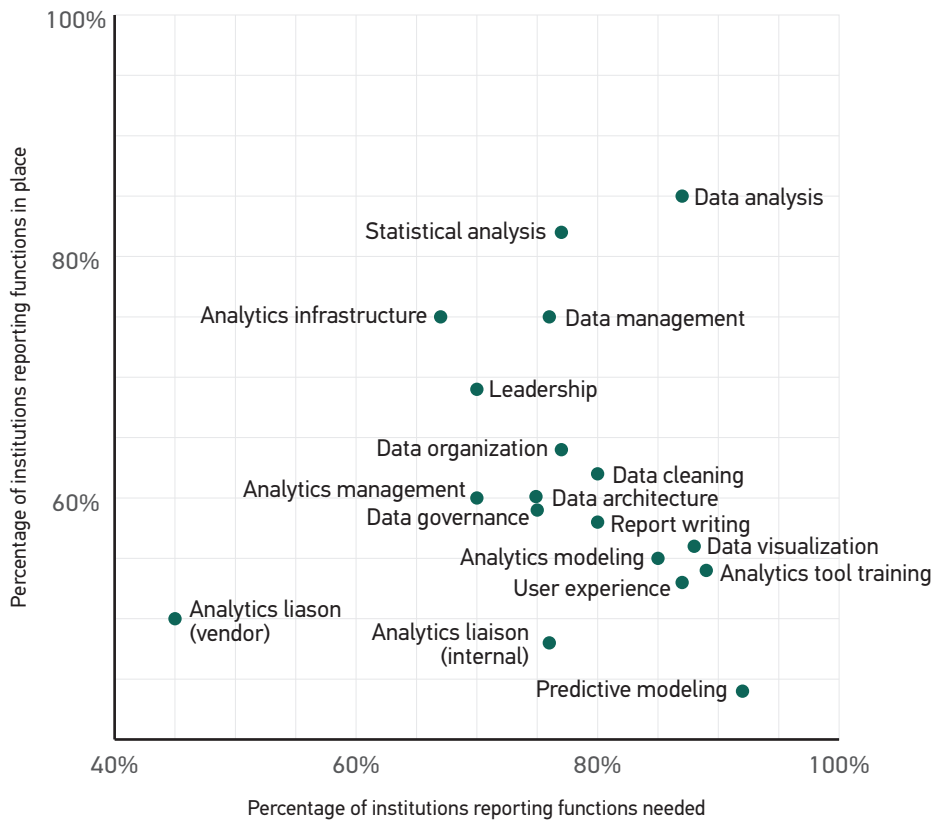


Figure 9. Extent of analytics staff functions needed

Focus group members reported that they relied mainly on occasional “one-off” analytics hires in IT or IR but agreed that a concerted effort to build cross-functional teams would be a better approach. Ideal staff characteristics they mentioned included an understanding of the academic business cycle and an ability to tell stories and see the big picture, in addition to having technical and analytical skills. Recognizing that it can be hard to find people who possess all the right skills, one participant noted that “it seems to work really well to pair up people who are really good with software systems with people who really understand the data. When we have teams like that we get things done quickly.”

Technology and Infrastructure

Basic technology elements that support analytics are widely available and are relatively up to date. Business intelligence (BI) tools were reported in place at 86% of CDS 2014 institutions, and data warehouses were in place at 77%. Almost three-quarters of institutions had both. With mean implementation dates of 2008 in each case, these are among the more recently adopted technology systems on a typical campus. Taking into account both date of adoption and future plans for new or replacement systems, they rank third (BI tools) and fifth (data warehouses) in rate of change among 20 different technology systems. This suggests that institutions are making it a priority to update or enhance these analytics tools.

There are signs, however, that learning analytics tools are less developed than those for institutional analytics. Of 12 technologies included in a deployment index developed by EDUCAUSE to help institutions assess their ability to support student success efforts, only 3 (degree audit, credit transfer, and early-alert systems) were deployed at half or more CDS institutions, and many such deployments had targeted rather than institution-wide scope. Only one in four institutions reported a data warehouse specifically for student success data—about a third the number reporting data warehouses generally—and only one in five had student success analytics dashboards. Mean deployment status overall was 2.7 on a 5-point scale.

Should these limitations inspire more investment in technologies and tools? No doubt improved tools would help. Institutions with more analytics technologies deployed tend to have higher analytics maturity scores, as do those that have deployed BI tools and data warehouses. But it's important to keep in mind that many factors play a role in analytics maturity, including data efficacy, a decision-making culture, and investment/resources. These issues, rather than technology, tended to come up when focus group members discussed the factors of analytics success. Institutions that want more from analytics may do better to address weaknesses in these areas first to ensure that newly adopted technology is poised to make a difference.

Basic technology elements that support analytics are widely available and relatively up to date, but there are signs that learning analytics tools are less developed than those for institutional analytics

Concerns and Challenges

We asked institutions to rate concerns and challenges related to the use of analytics in higher education, focusing on four broad areas: affordability, data, culture, and vendor management. (The survey questions did not distinguish between institutional and learning analytics.) We also discussed these issues with focus groups. In general, we saw little change from responses to similar questions posed in 2012 (figure 10).

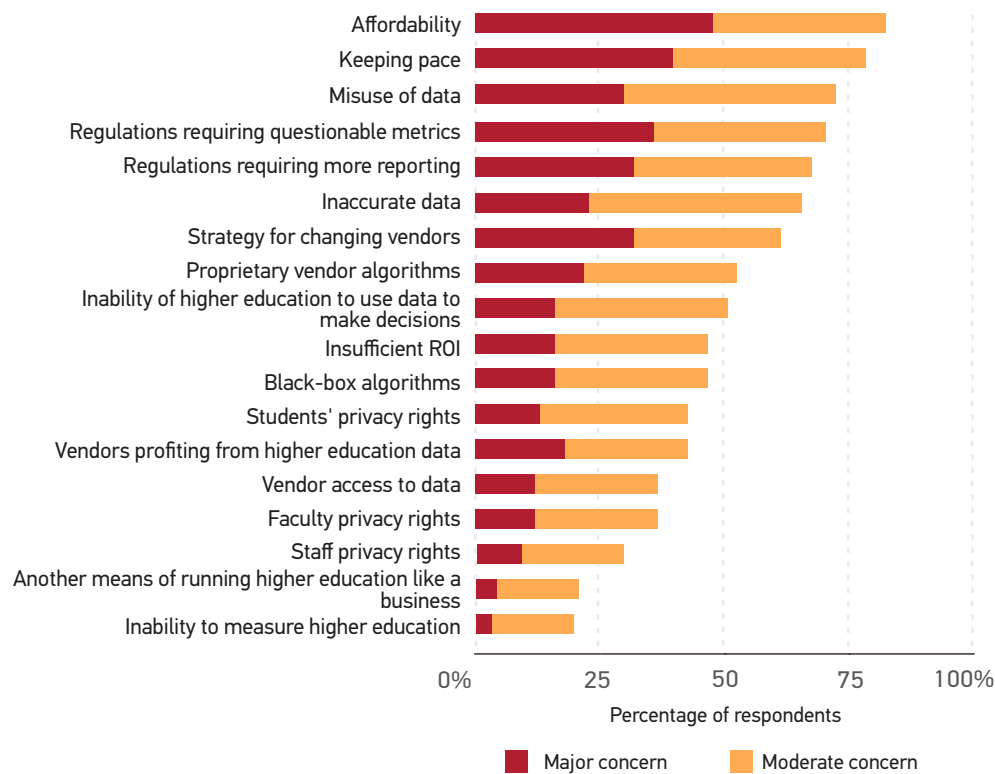


Figure 10. Concerns about use of analytics in higher education

Affordability

Despite an improving economy, the ability “to afford to implement analytics effectively” remains the top concern, as it was in 2012. Nearly half described this as a major concern, and a third as a moderate one. Such high levels of concern about affordability suggest that many institutions see low investment levels as an impediment to analytics, rather than simply an appropriate response to their needs. Similarly, respondents who are concerned about strategic disadvantage due to lack of analytics investment (“keeping pace”) greatly outnumber those concerned that the return on analytics investments will be insufficient.

Data Interpretation, Quality, Access, and Regulation

Nearly three-quarters of institutions expressed moderate or major concerns that analytics data will be misused or lead to false conclusions. A similar number worried that data used in analytics aren’t always accurate, and focus groups spoke of pressure to meet demand for “charts and drill-downs” regardless of potentially poor data quality. At the same time, as one participant noted, “the best way to find your data quality issues is when people start using the data.” Institutions worry that the very forces that are driving them to adopt analytics could be distorting the results: The large number of those expressing concerns that government regulations will “require more reporting on performance metrics” is very close to the number worried that regulations will require reporting on “questionable/flawed performance metrics.” By contrast, institutions are less concerned about breaching of student, faculty, and staff privacy rights. Implied in this pattern of concern is the need to systematically improve data quality and to better communicate what the data can and can’t explain.

“The best way to find your data quality issues is when people start using the data.”

— *ECAR focus group member*

Culture

It is a commonplace of analytics advice that institutions must prepare themselves not just to collect and analyze information but also to distribute it and act on it—in short, to incorporate analytics into institutional culture as reflected in management practices and decision making. Our respondents tended to see this as a real but mid-level issue. While about half said higher education “doesn’t know how to use data to make decisions,” for most this is a moderate rather than a major concern. About one in five saw analytics as the wrong model for higher education because it is too business-like, again mostly characterizing this as a moderate concern. Although the decision-making culture dimension has an average of 3.4, focus group members did note some challenges to introducing analytics habits into decision-making processes. “We don’t ever come back around and measure to see if a change actually did make a difference,” one participant noted. Another spoke of the need to create “an entire ecosystem that supports data and allows the data to grow and be propagated and used properly—farmed, if you will.”

Vendor Management

Recent years have seen explosive activity in the education marketplace, including the rise of outsourced analytics services (e.g., Education Advisory Board, Civitas), learning analytics systems (Blackboard Analytics, Brightspace Insights), and integrated planning and advising services technologies (Hobson’s, College Source). Many of these services and solutions host institutional data on vendor machines and use proprietary algorithms. Among the issues raised by the new vendor landscape, by far the most concerning to our respondents was the need for an exit strategy should it be necessary to change vendors. This concern underscores institutional dependence on analytics and may be exacerbated by limited home-based staffing and skills. Though still of concern to about half of respondents, dependence on vendor algorithms was more likely to be a moderate rather than a major concern.

Of issues related to the new analytics vendor landscape, by far the most concerning was the need for an exit strategy should it be necessary to change vendors

Analytics Maturity

EDUCAUSE has developed a maturity index to help higher education institutions measure their overall organizational capacity in analytics. The index was originally developed in our 2012 study and was subsequently expanded and incorporated into the 2014 Core Data Service survey (see sidebar “The Analytics Maturity Index”). The CDS benchmarking service is used by colleges and universities to inform their IT strategic planning and management. Institutions can use CDS to make the case for additional resources, to evaluate organizational structure and governance, or to calibrate or justify performance.

The maturity data we collected in the 2012 analytics study and CDS 2014 permit us to examine maturity for all respondents in both years and to compare results for questions that appeared in both versions of the index among the 74 institutions that responded to both surveys.

A growing body of maturity data, the changing nature of analytics, and an improving understanding of how factors in analytics maturity relate to other areas of IT and higher education all mean that our model for analytics maturity will continue to evolve over time. In the meantime, investigation of data collected so far through the lens of our maturity model gives us an opportunity to examine where we stand and what we can do to improve.

The Analytics Maturity Index

ECAR released the first stand-alone analytics maturity index in 2012. This first-generation version of maturity modeling served as a basis for the analytics maturity index that is now part of the EDUCAUSE Core Data Service. The current index measures 32 factors contributing to analytics maturity and is organized into six categories or dimensions. A score on a scale of 1 (low) to 5 (high) is calculated for each of the dimensions, and the mean of those scores is the overall institutional maturity score.

The current dimensions of analytics maturity are as follows:

- **Decision-making culture**, including senior leadership commitment, and the use and cultural acceptance of analytics
- **Policies**, including data collection, access, and use policies
- **Data efficacy**, relating to quality, standardization, and “rightness” of data and reports and the availability of tools and software for analytics
- **Investment/resources**, consisting of funding, an investment versus an expense mentality, and the appropriateness of analytics staffing
- **Technical infrastructure**, consisting of analytics tools and the capacity to store, manage, and analyze data
- **IR involvement**, capturing interaction between IT and IR

The six dimensions above vary from the original five used in the 2012 maturity index. This second-generation model adjusts the dimension names and contributing factors to better align with institutional practices. This updated analytics maturity model is part of a new [EDUCAUSE Benchmarking Service](#) that will launch in early 2016.

Analytics Maturity 2012 and 2014

It isn't hard to sum up the maturity progress observed from 2012 to 2014: There wasn't much. As figure 11 shows, overall maturity among the 2014 CDS respondents averaged 3.4. The mean score in 2012 (for a somewhat different maturity model) was slightly lower at 3.2, but the 2014 score is still well below advanced maturity.⁴ Not surprisingly in light of findings already identified in this report, investment/resources had the lowest dimension score in 2014, just as the similar investment dimension did two years earlier. Governance/infrastructure, the top dimension in 2012, was reconfigured in the new maturity model. These items were distributed into the policies and technical infrastructure dimensions. IR involvement was the highest dimension score in 2014. Analytics services are most often delivered as a joint program run by IR and IT. Having a highly engaged senior institutional research leader involved in analytics and having effective communication between IT and IR professionals are essential qualities of analytics maturity. Item-by-item comparison of responses from the same institutions in the two different years found no significant differences for 17 of the 20 items that are found in both surveys.⁵ Among differences found, institutions were more negative (though still generally positive in absolute terms) about leadership commitment to analytics and about the identification of key outcomes the institution is trying to improve.

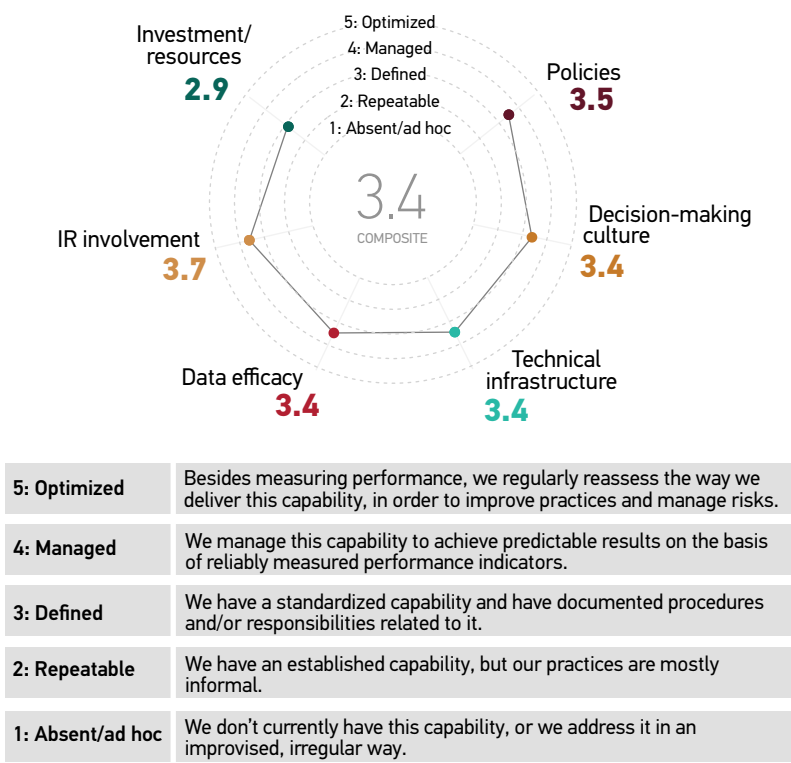


Figure 11. Higher education analytics maturity, 2014

Improving Analytics Maturity

In the end, analytics maturity results from the specific conditions that hinder it or foster it at a particular institution. We encourage institutional leaders to organize an effort to assess their institution's analytics maturity using the [online EDUCAUSE tool](#),⁶ and to take part in the annual EDUCAUSE Core Data Service survey. Nonetheless, larger patterns may help an institution put its own situation in context, recognize its relative strengths and weaknesses, and prioritize efforts to improve. Below we consider issues that CDS 2014 results show commonly undermine maturity in each of the dimensions of analytics, and we suggest approaches to improvement.

IR Involvement. Creating an analytics program to enhance decision making across an institution is a collaborative effort. In 43% of the institutions surveyed, responsibility for analytics services is shared by IT and IR. For another 27% of institutions, responsibility for analytics is on IR. Cultivating effective communication between IT and IR departments is essential to building analytics maturity. "IR teams already know how to use data to support external reporting requirements. It might be possible to take advantage of the existing analytics staff skill sets and tools to focus on internal problems, as well, or at least to inform analytics strategy setting."⁷ Having a senior-level IR lead involved in the planning for high-level strategic initiatives or questions is also a factor in maturing an analytics program or service.

Technical Infrastructure. Basic technology elements that support analytics are widely available and are relatively up to date. BI tools were reported in place at 86% of CDS 2014 institutions, and data warehouses were in place at 77%. Almost three-quarters of institutions had both. Having analytics tools and software with the capacity to store, manage, connect, analyze, and interact with stakeholders is a sign of analytics maturity.

Decision-Making Culture. We mentioned earlier that institutions tend to view their analytics culture positively, though the feeling is hardly unanimous: A bare majority (53%) of CDS 2014 respondents agreed that their culture overall accepts the use of data to make decisions. Only about a third agree, however, that they have a process for moving from what data say to making changes or decisions. Strengthening change-management practices and incorporating data review formally into decision-making processes could help boost this crucial ability to act.

EDUCAUSE Benchmarking Service Beta

Launching in 2016, a new EDUCAUSE benchmarking report service, built on the CDS database, will help IT leaders and their colleagues assess and benchmark organizational maturity and technology deployment for strategic initiatives. Assessment of maturity and technology deployment can help institutions measure the capability to deliver IT services and applications in a given area, examine progress, and measure maturity broadly.

This majority substantially exceeds, however, the 32% who agreed that faculty largely accept the use of analytics. If that sounds familiar, be sure to regularly take the pulse of the faculty community's willingness to use data to make decisions. EDUCAUSE research shows that the strongest motivator to get faculty to incorporate technology into teaching is evidence that students benefit; the same might hold for receptivity to analytics.⁸ Identify pockets of individuals who are unconvinced and target examples to questions or problems that directly affect them.

Policies. This is another area where institutions tend to rate themselves positively, but weaknesses here tend to derive from inadequate policies and practices in information security and in institutional review boards. Fortifying policies in these areas is an essential step toward analytics maturity. Consider creating mechanisms to communicate analytics plans, goals, and achievements to major constituents. As one focus group member put it, "Success is really just trust."

The Virtues of User Access

Focus groups told us that easy-to-use, self-service BI tools that give decision makers quick access to accurate and useful data is a welcome developmental step in analytics. For most, this was still an aspirational goal. For a few, it was an impressive end in itself.

To get to this point, institutions must have data governance protocols, data quality practices, BI tools, and a culture of inquiry in place. IR professionals in these institutions can spend less time finding, cleaning, and preparing data for internal inquires and external reports and more time on research innovations. Although there might have been early concerns that analytics reporting features and machine-generated output would replace IR, instead there is promise that analytics can put the *research* back into institutional research. As one focus group member put it, user access to data is liberating, not threatening, for IR.

Data Efficacy. Institutions rate themselves low on data standardization, especially in support of external comparisons, and on processes for weeding out reports that no longer have value. To address such issues, work on improving data standardization; develop processes to eliminate, phase out, or update data and reports that are no longer valuable; and enhance user access to data with self-service tools like dashboards or portals (see sidebar “The Virtues of User Access”). Focus group members emphasized the need to identify all those who touch, view, or use data and to train them in the practices of good data stewardship.

Investment/Resources. It doesn’t take long to understand why this dimension is the laggard. Only one in five institutions agreed that it has sufficient funding to meet current needs, and a dismal 13% said they have an appropriate number of data analysts. Facile advice to “get more money” isn’t appropriate here, but it is necessary to face the fact that analytics can accomplish only so much without appropriate investment. Make the case for investment by using analytics on itself: Demonstrate through examples, even if of limited scope, that analytics is an investment with real potential for return. Chronically constrained resources make it all the more important to be sure that the analyst workforce is trained in the right skills and that their duties are prioritized to favor the most important tasks.

Make the case
for investment by
using analytics
on itself:
Demonstrate
through
examples, even if
of limited scope,
that analytics is
an investment
with real potential
for return

Recommendations

- **Define strategic needs and priorities.** Be sure you know what problems you expect analytics to solve. As your institution's strategic planning process unfolds, determine and document how progress toward strategic goals will be measured and whether the data to assess progress exist or must be developed. Identify who is responsible for data analysis and to whom results will be delivered. If existing strategic plans or processes don't address these issues, it may be necessary to do this work retroactively.
- **Know where you stand.** Use the EDUCAUSE maturity index to measure your institution's capabilities in detail. Make this a leadership group exercise to elicit discussion and find consensus about your institution's performance on each maturity factor. Participate in the EDUCAUSE Core Data Service survey and use CDS data to benchmark your institution against peers, but also assess your strengths and weaknesses in light of the analytical requirements demanded by your strategic needs. Do a gap analysis to identify the improvements that will have the most impact, and prioritize accordingly.
- **Build the case for investment.** Analytics is chronically underfunded at most institutions. So long as it's seen as an expense or a technology item, it's likely to remain so. Develop a case for analytics investment based on short- and long-term returns from analytics-based improvements in retention, recruitment, cost avoidance, or improved efficiencies. Small concrete examples are more credible than big speculative promises; plan a series of small, short-term wins to establish a foundation for bigger investments.
- **Think about the whole mission.** Many institutions have developed institutional analytics more than learning analytics. Seek a balance between the two, recognizing that learning analytics may involve challenges to unexpressed but powerful cultural norms.
- **Provide analytics leadership.** Institutions with dedicated analytics leadership tend to have higher analytics maturity. If funding makes it possible, appoint an analytics leader who can address data issues widely, develop relationships, guide difficult analytics discussions, and build a team with the right skills.

- **Embrace collaboration.** Analytics calls for a collaborative sensibility involving interaction and mutual support among leadership, IT, institutional research, and functional departments, both administrative and academic. Implement analytics with cross-functional teams and make sure robust mechanisms are in place so that stakeholders can participate in important analytics decisions.
- **Develop people and skills before tools.** Strong analytics staff with modest tools will usually outperform an underdeveloped staff equipped with the best solutions available. To develop a deep analytics bench, look for broad skills at the hiring stage, and invest in training over the long term. Where needs can't be met internally, consider the growing range of outsourced data analysis services.
- **Educate yourself about analytics trends.** Analytics, the problems it addresses, and tools for applying it are changing fast. Be sure you stay informed about best practices, innovative applications of analytics, and the evolving solutions marketplace.

Methodology

The 2015 analytics survey was administered to a sample of EDUCAUSE member institutions (N = 245, response rate 13%). Tables A and B summarize respondents' Carnegie class and institution size distributions. The survey contained both quantitative and qualitative items. Data collection occurred between May 12 and June 7, 2015.

In addition to the survey, data were collected from six focus groups conducted at the EDUCAUSE Administrative IT Summit in Seattle, Washington, in June 2015. Participants included leadership and professionals from IT, IR, dedicated analytics units, and business and finance. Additional data sources included the 2014 EDUCAUSE Core Data Service and Gartner's cross-industry analysis of the state of analytics.

Table A. Respondent Carnegie class distribution

Carnegie Class	Frequency	Percentage
AA	29	12%
BA	49	20%
MA Public	23	9%
MA Private	33	13%
DR Public	40	16%
DR Private	19	8%
Other	24	10%
Non-U.S.	28	11%

Table B. Respondent FTE enrollment size distribution

Size	Frequency	Percentage
Less than 2,000	40	16%
2,000–3,999	57	23%
4,000–7,999	40	16%
8,000–14,999	32	13%
15,000+	39	16%
Unknown	37	15%

Acknowledgments

EDUCAUSE expresses its gratitude to institutions and focus group members who contributed to our 2015 analytics study. The study also benefited from the contributions of our subject matter expert panel, who assisted with study design and with valuable comments and suggestions: **John Campbell** (West Virginia University), **Vince Kellen** (University of Kentucky), **Steve Lon** (University of Michigan–Ann Arbor), **Andrea Nixon** (Carleton College), **Jeff Schram** (Missouri University of Science and Technology), and **Celeste Schwartz** (Montgomery County Community College). **Kathryn Northcut** (Missouri University of Science and Technology) conducted analysis of focus group responses. The analytics study design and survey development were carried out by **Jacqueline Bichsel**, **D. Christopher Brooks**, and **Eden Dahlstrom** of EDUCAUSE and **Terri-Lynn Thayer** and **Glenda Morgan** of Gartner. Also from EDUCAUSE, **Susan Grajek**, **Eden Dahlstrom**, **D. Christopher Brooks**, **Jamie Reeves**, and **Gregory Dobbin** reviewed content and contributed many helpful suggestions, and **Kate Roesch** designed and created the report graphics.

Notes

1. Jacqueline Bichsel, *Analytics in Higher Education: Benefits, Barriers, Progress, and Recommendations* (Louisville, CO: ECAR, June 2012), available from the [ECAR 2012 Analytics Research Hub](#).
2. Susan Grajek, *Higher Education's Top 10 Strategic Technologies for 2015* (Louisville, CO: ECAR, January 2015), available from the [ECAR 2015 Strategic Technologies Research Hub](#), and Susan Grajek, *Higher Education's Top 10 Strategic Technologies for 2014* (Louisville, CO: ECAR, February 2014), available from the [ECAR 2014 Strategic Technologies Research Hub](#).
3. Betsy Tippens Reinitz, *Building Institutional Analytics Maturity*, summit report (Louisville, CO: ECAR, September 2015).
4. The 2012 maturity index scores were calculated from a set of 21 factors, which form a subset of the larger (35-factor) 2014 Core Data Service maturity index. The 2012 culture/process dimension was subsequently broken into two separate factors in 2014.
5. Responses from the same institution were matched but were not necessarily completed by the same person each time.
6. The online analytics MI tool represents the six dimensions from the first-generation version of the analytics maturity index. This tool is still a functional assessment of institutional analytics maturity, but it differs from the second-generation model represented in figure 11. As noted in the text, the maturity index dimensions were reconfigured in 2015 and are incorporated into the annual CDS data collection initiative.
7. Betsy Tippens Reinitz, *Building Institutional Analytics Maturity*.
8. Eden Dahlstrom and D. Christopher Brooks, *Study of Faculty and Information Technology 2014* (Louisville, CO: ECAR, August 2014), available from the [ECAR 2014 Student and Faculty Technology Research Studies Research Hub](#).