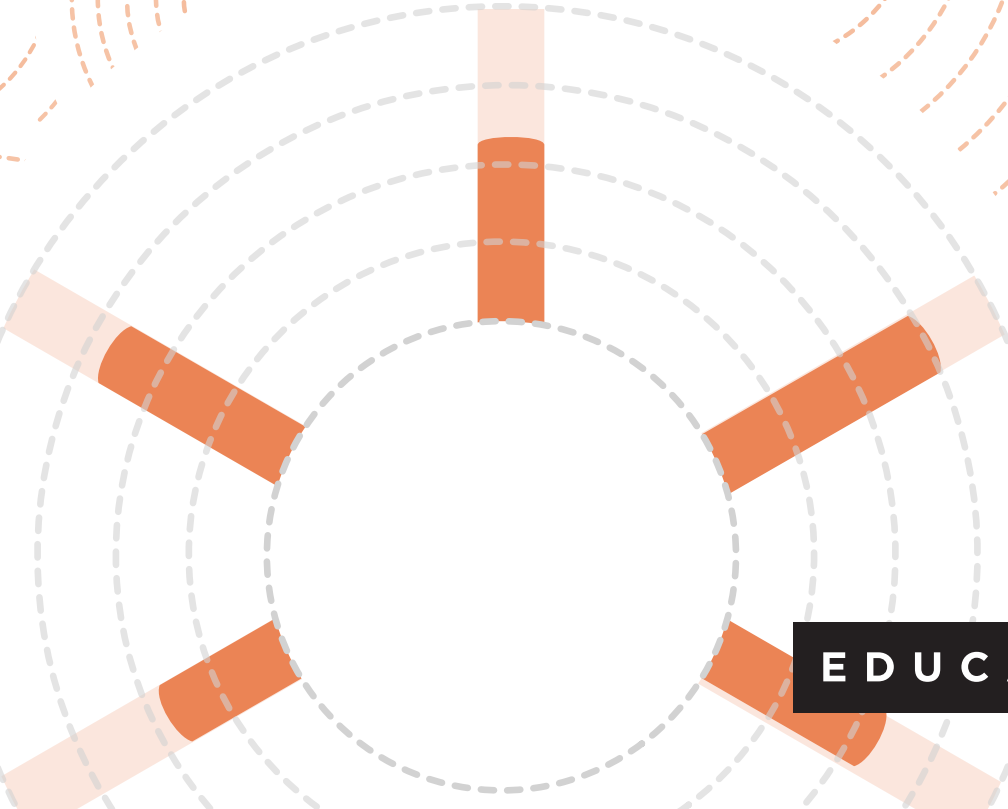
EDUCAUSE CENTER FOR ANALYSIS AND RESEARCH

Digital Capabilities in Higher Education, 2016: Analytics



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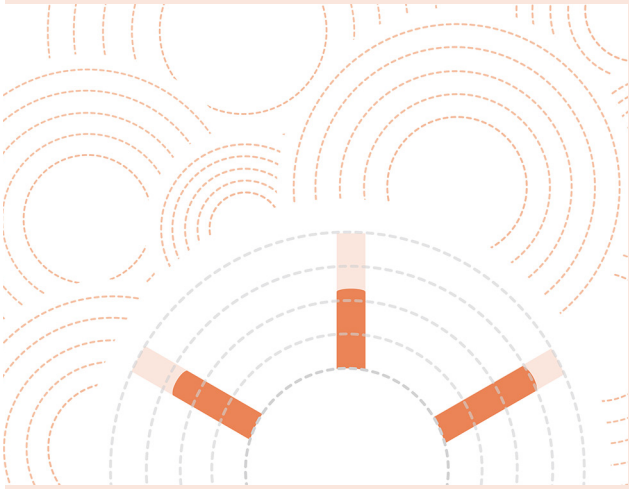
Contents



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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 educause.edu.

Introduction

Technology is key to the future of higher education. Digital capabilities describe the application of technology to the core functions of an enterprise. EDUCAUSE uses maturity and deployment indices to track digital capabilities within higher education. Maturity indices measure the *capability to deliver IT services and applications* in a given area. They examine not just technical facets of progress but also dimensions such as culture, process, expertise, investment, and governance. They enable institutions to determine where they are and where they aspire to be. Deployment indices measure *stages of deployment for specific technologies and services*, which are aggregated to track progress by area. The maturity and deployment indices are based on contributions to the EDUCAUSE Core Data Service, an annual survey and benchmarking service open to all higher education institutions. This report on analytics as a digital capability is part of a series that describes EDUCAUSE maturity and deployment indices and their current status in higher education.

Over the past decade the use of analytics in higher education has gone from an innovation to a standard for many institutions. Analytics and data-informed decision-making topics have made the EDUCAUSE annual Top 10 IT Issues list[1] for five of the past six years. This year the Top 10 IT Issues were configured into four themes that colleges and universities are addressing: develop the IT foundations, develop the data foundations, ensure effective leadership, and enable students to be successful (see figure 1). Analytics fits into these themes by way of data foundations—highlighting data-informed decision making and ensuring that business intelligence, reporting, and analytics are relevant, convenient, and used by administrators, faculty, and students.

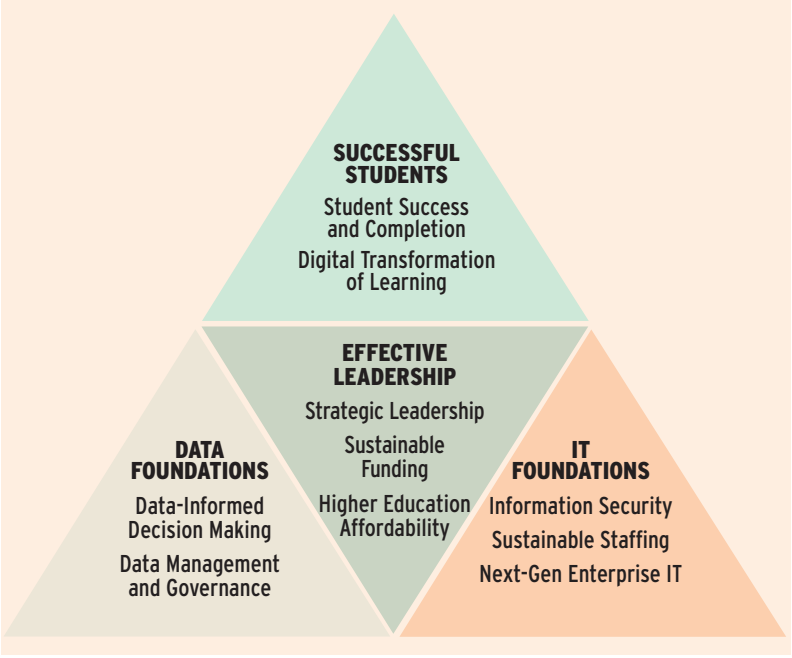

Figure 1. Four themes that colleges and universities are addressing

Our definition of analytics is the use of data, statistical analysis, and explanatory and predictive models to gain insight into and act on complex issues. EDUCAUSE first measured analytics maturity in 2012 as part of an ECAR research report.[2] Since then, the EDUCAUSE Core Data Service (CDS) survey[3] has provided the data that underpin the maturity and deployment indices.

In 2016, the scale for measuring the maturity index was reimagined. In previous years, the CDS survey asked respondents to rate specific areas of maturity using a 5-point degree-of-agreement scale. The new scale was designed to better understand the extent to which each item has been implemented by an institution through a measurement of actual levels of achievement (see table 1). With this major change to the scale, it is not surprising to find that the composite maturity rating dipped from 3.4 to 3.3, with scores on each of the six dimensions of the index also falling by 0.1 point—with the exception of data efficiency, which remained stable.

Table 1. Old and new scales for the analytics maturity index

Old Scale	New 2016 Scale
Strongly disagree	Not achieved (0–5%)
Disagree	Slightly achieved (6–35%)
Neutral	Partially achieved (36–65%)
Agree	Largely achieved (66–95%)
Strongly agree	Fully achieved (96–100%)

Over the past five years of examining and refining the measurement of maturity and deployment in analytics, it has become apparent that the needle indicating a gain in traction is hard to move. The analytics composite score indicates the overall maturity and reaches across multiple departments, involving both top-down initiative acceptance and bottom-up best-practice formation.

Highlights

Maturity

- The analytics maturity index consists of six dimensions: data efficacy, decision-making culture, investment/resources, policies, technical infrastructure, and institutional research (IR) involvement.
- IR involvement is the most advanced dimension. Well over half of institutions have largely achieved or fully achieved maturity in effective communication between IR and IT, as well as in having IR leadership involved in planning for high-level strategic initiatives or questions.
- Investment/resources has the lowest average maturity. Fewer than one in four institutions have invested sufficient funding to meet current analytics needs, have a sufficient number of professionals who know how to support analytics, and have an appropriate number of data analysts to do analytics work.
- Analytics maturity is not uniform among all institution types. There are statistically significant differences in maturity among institution types; these differences appear in overall analytics maturity and across all dimensions of the scale, with the exception of technical infrastructure. The dimensions of policies and technical infrastructure are statistically significantly different for institutions of varying size rather than type.
- Associate's institutions have the highest maturity in every dimension except policies. With the inception of the new scale this year, AA institutions have pulled ahead of all other institution types. Many of the AA institutions are currently or have in the past participated in the national Achieving the Dream initiative that focuses on evidence-based institutional improvement. This partnership could have a significant impact on the importance leadership places on analytics at these institutions.

Deployment

- The analytics deployment index consists of 11 technologies and services classified into five categories (universal, mainstream, growing, emergent, and experimental) based on the extent of institution-wide deployment.
- The levels of deployment increased across all 11 technologies since 2015; the most notable change is the decrease in the number of institutions reporting no deployment.
- No analytics technologies or services were deployed at a universal level (>80% of institutions) or a mainstream level (61–80% of institutions);

targeted deployment of analytics technologies is much more common than institution-wide deployment.

- Only database management systems (DBMSs) were deployed *institution-wide* at more than half of institutions. Among *targeted* deployments, web data capture; extract, transform, load (ETL); data warehouses; business intelligence (BI) reporting; and statistical analysis are deployed at more than half of institutions.
- Institutions with higher analytics maturity have generally also deployed more analytics technologies and services. Broader deployment of the tools and technologies that support analytics will likely track with increased investment/resources maturity.

Advice

- Understand that data-informed decision making may entail a cultural shift for many institutions. Strengthening change-management practices and incorporating data review formally into the decision-making process are crucial if this shift is to occur in everyday practice.[4]
- Reframe analytics expenditures not as costs but as investments. This better communicates a return that will help institutions realize aspirations for cultivating a decision-making culture.
- Recognize that the relationship between IR and IT is essential for building analytics maturity. Having leaders from both IR and IT at the table and involved in planning for high-level strategic initiatives aids in maturing an analytics program or service.[5]
- Encourage senior leaders to prioritize and invest in the resources (tools and talents) needed to grow analytics services.
- Create an organizational framework to govern and manage institutional data assets and to develop a data infrastructure that will enable statistical analysis and the explanatory and predictive models that are the backbone of analytics.
- Understand and improve your institution's analytics strength by regularly assessing it. IT leaders can invite other institutional constituents, such as academic leaders and institutional technologists, to collaboratively complete the maturity and deployment assessments using the EDUCAUSE Benchmarking Service. The results can help institutional teams
  - identify their institution's strengths and development needs relative to those of peers and to their own aspirations,
  - inform strategic planning for analytics, and
  - provide metrics to track ongoing progress against the plan and relative to peers'.

Analytics Maturity

In 2016, 439 U.S.-based institutions reported on their analytics maturity in the EDUCAUSE Core Data Service (CDS) survey (Capability and Technology Deployment). Respondents indicated their level of achievement on 32 statements about analytics capabilities that subject-matter experts had identified as key institutional components for analytics. For reporting purposes, institutional maturity is classified into the following five categories:

1. **Absent:** Capability components are largely not achieved. Little to no planning is under way.
2. **Initial:** Capability components exist either latently or slightly. Early planning and discussions may be under way.
3. **Developing:** High-priority capability components may be largely or fully achieved, while other components are still maturing. Active planning and strategic attention are under way.
4. **Established:** Capability components have been developed but may not yet be incorporated into institutional culture and practices. Efforts to improve sustainability or scalability are under way.
5. **Optimized:** Capability components have been developed with an eye toward sustainability, adaptability, and scalability. Components are fully integrated into institutional practices and culture (and may be influencing both).

Figure 2 summarizes the current status of analytics maturity in higher education. The figure displays analytics maturity scores for each of the six index dimensions, as well as a composite maturity score for overall analytics maturity. The six dimensions of analytics maturity are as follows:

- **Data efficacy:** Demonstrates that policies and processes are implemented for institutional management of the quality, standardization, and validity of data and reports; ensures appropriate data management tools are available.
- **Decision-making culture:** Advocates within the culture of the institution for the use and acceptance of analytics, including senior leadership commitment.
- **Investment/resources:** Develops and implements a financial plan to evaluate the return on investment for both personnel and analytics tools.
- **Policies:** Demonstrates an ability to create formal and informal policies at the department and institution levels regarding data collection, access, storage, and reporting.

- **Technical infrastructure:** Builds an environment with the available analytics foundational tools and also establishes the capacity to store, manage, and analyze data.
- **IR involvement:** Establishes and maintains a collaborative working partnership with the IR organization.

The appendix provides a draft rubric with detailed definitions of all levels of maturity across the six dimensions.

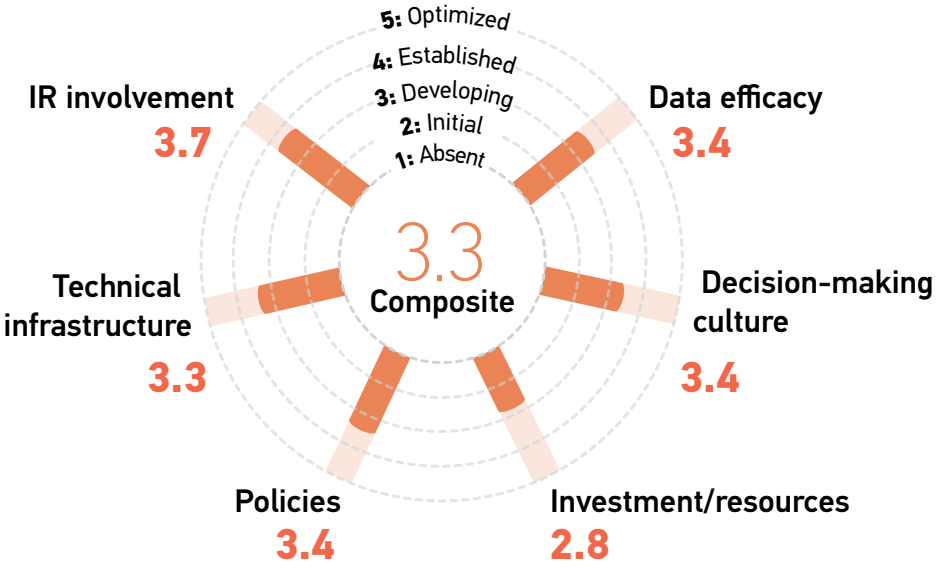

Figure 2. Current status of analytics maturity

IR involvement is the most advanced dimension; investment/resources is the least. Responses are expectedly anchored near the midpoint of the 5-point scale used to measure maturity. Differences of at least 0.1 between any two dimension scores are statistically significant.

Figure 3 displays the maturity scores for the individual capability components within each of the six analytics maturity dimension scores in figure 2. Factor analysis was used to validate the placement of analytics capability components into each of the maturity dimensions.

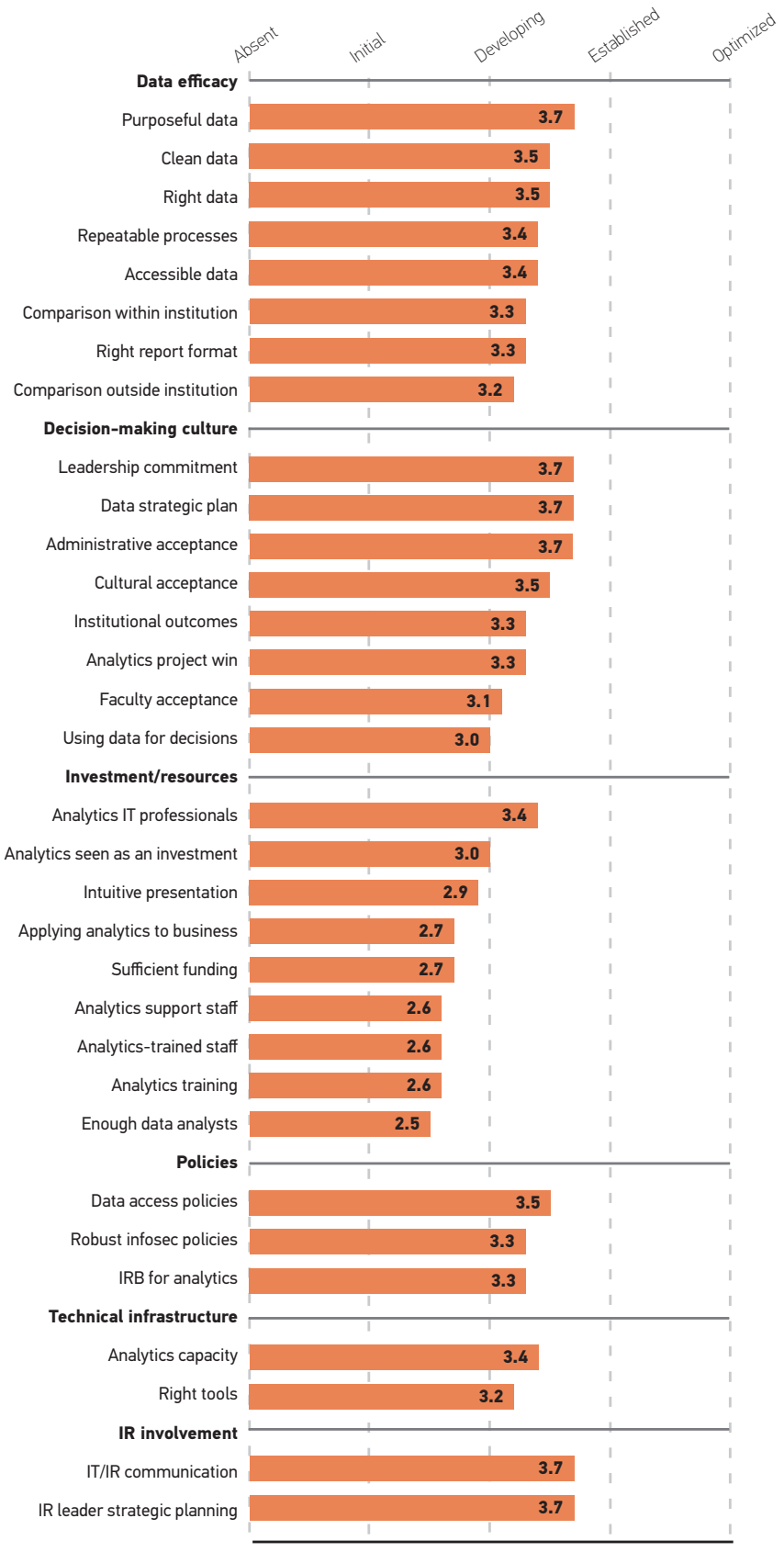

Figure 3. Analytics maturity index items and mean scores

Looking at past data shows that IR involvement has been rated the highest every year since data collection started back in 2014. In 2016 more than a third of institutions rated themselves established, and just over 20% rated themselves optimized in IR involvement in analytics at their institution. These ratings are based on the belief that institutions have effective communication between IT and IR departments, and also that senior-most institutional research leaders are involved in planning for addressing high-level strategic initiatives or questions. IR involvement differs by institution type, with associate's institutions rated above the mean and higher compared with other institution types: Associate's institutions scored 4.0, while private master's institutions rated below the mean at 3.4.

At the bottom, investment/resources is rated 2.8 and has been the least advanced dimension since data collection began in 2014. It would not surprise most IT leaders to learn that securing investment/resources for analytics is reported absent at 21% of institutions and is in the initial stages of early planning at over a third of institutions. Institutional differences by type resemble those of IR involvement: Once again, associate's institutions come in above the mean with a score of 3.2, while private master's institutions are again rated below the mean at 2.4. Six of the nine items that make up the investment/resources dimension are related to people or talent. Broken down even further, the two lowest scores for investment/resources are related to a deficiency of talent; the data show there are simply not enough people to do the work that would move the analytics maturity needle.[6] For example, if IR analysts could find their way out from under the large burden of compliance reporting, they might be able to do more with analytics.

The analytics maturity of individual institutions varies. Figure 4 shows a right-skewed distribution of maturity across institutions: Nearly twice as many institutions are at the absent or initial maturity stage as at the established or optimized stage. In fact, no institutions demonstrated the across-the-board strength to qualify as optimized, with all capability components in place, sustainable, adaptable, and scalable. The maturity of about one in five institutions could be called established, with capability components in place but not fully sustainable, scalable, or incorporated into institutional culture and practices. The analytics maturity of about one-half of institutions is developing, meaning active planning and strategic attention are under way, high-priority components of capabilities may be in place, and early versions of some capability components may be even more fully developed. About one-third of institutions have achieved only a maturity level of initial, with early planning and discussions under way and only partial or latent existing capability components. Only 3% of institutions, or 13 out of our sample of 439, rated their analytics capability as absent, meaning that if they address analytics at all, it is in an improvised, irregular way. (See the sidebar "Institutional Differences in Maturity" to learn about which types of institutions have higher and lower analytics maturity scores.)

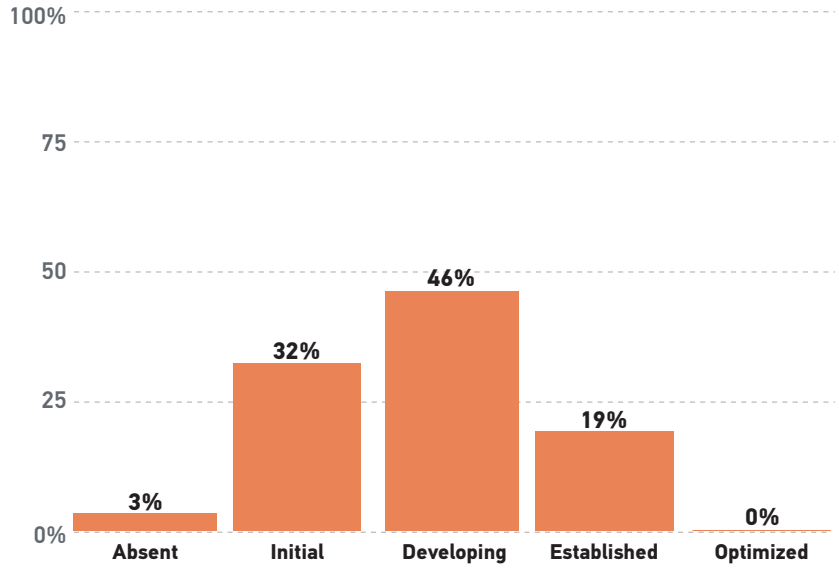

Figure 4. Distribution of analytics maturity across institutions

Institutional Differences in Maturity

There are statistically significant differences in composite analytics maturity scores by Carnegie Classification but not by institution size. Differences by Carnegie Classification exist across all dimensions, with the exception of technical infrastructure. There are, however, small but significant differences ($p < 0.05$) in the policies dimension for institutions of different size; this is also true for the dimension measuring technical infrastructure.

The uniformity of analytics maturity by institution size may make it particularly interesting to compare a single institution's maturity scores with those of selected peer institutions. A personalized benchmarking experience may bring a better understanding of the practices that contribute to maturing an analytics initiative. For readers wishing to better understand analytics maturity within their particular institutional demographic, EDUCAUSE has introduced a new service to enable institutions to compare their analytics maturity with that of peers. The EDUCAUSE Benchmarking Service is available for analytics and seven other areas.

Every year EDUCAUSE tracks higher education's strategic technologies. One of the key findings of the 2017 strategic technologies report was that associate's institutions are at the forefront in the application of technology to student success as well as in teaching and learning. This trend continues with the finding that associate's institutions have the highest maturity in every classification except policies. Taking a closer look at the 82 community colleges that participated in 2016, we find that 22% also participate in the national reform movement for student success, Achieving the Dream. There are a host of ways institutions can utilize the resources provided by Achieving the Dream, including a data tool to support decision making and institutional effectiveness.

Deployment: Analytics Services and Technologies

EDUCAUSE's analytics maturity and deployment indices are complementary. While the maturity index measures an institution's *ability* to deliver technologies and services, the deployment index measures which technologies and services *are actually being delivered*. The analytics deployment index consists of 11 items that subject-matter experts identified as key institutional analytics technologies and services. These are by no means the entirety of analytics services and technologies institutions are delivering. Not included in this index are emerging technologies such as the uses of big data, mobile BI applications, or predictive modeling specific to learning analytics. (See the sidebar "Analytics Technologies and Services on the Horizon.") The analytics maturity index also does not distinguish maturity measurements of *learning* analytics (intended to enhance or improve student success) from those of *institutional* analytics (intended to improve services or business practices). The ECAR study *The Analytics Landscape in Higher Education, 2015* found that for many analytics practices, institutional analytics dominates learning analytics. This was particularly evident in how institutions prioritized and invested in analytics: Twice as many respondents said institutional analytics was a major priority and a major investment as those who said learning analytics was a major priority and investment. Analytics capabilities are measured dimensions in the student success and e-learning maturity indices; more information on these specific aspects of analytics can be found on the EDUCAUSE Benchmarking Service resource hub.

Maturity measures the institution's ability to deliver technologies and services. EDUCAUSE's analytics deployment index complements the maturity index by identifying which technologies and services are actually being delivered.

Analytics Technologies and Services on the Horizon

EDUCAUSE tracks 13 emerging analytics technologies as part of its strategic technologies research:

- Flexible interactive platforms for descriptive and predictive analytics of institutional data
- Massively scalable database architectures and software
- Mobile apps for institutional BI/analytics
- Predictive analytics for institutional performance
- Predictive analytics for learning
- Predictive learning analytics (course level)
- Talent/workforce analytics
- Technologies for degree auditing (documenting and tracking students' educational plans)
- Technologies for improving analysis of student data
- Technologies for integrating student records data across case management systems
- Technologies for offering self-service resources that reduce advisor workloads
- Technologies for planning and mapping students' educational plans
- Technologies for triggering interventions based on student behavior or faculty input

Most of these items are not included in the deployment index because few institutions have yet deployed them; none is deployed institution-wide in more than 20% of colleges and universities. Many of these technologies may join the deployment index in coming years. We review all analytics technologies annually to decide which we will include in the deployment index, which in the strategic technologies report, and which we will retire.

In 2016, 485 U.S.-based institutions reported on their analytics deployment practices (from no deployment to institution-wide deployment) in the EDUCAUSE Core Data Service (CDS) survey.[7] For reporting purposes, the deployment of technologies and services is classified into the five categories (experimental to universal) displayed in figure 5, which also shows the percentage range of institutions that have deployed each technology institution-wide.

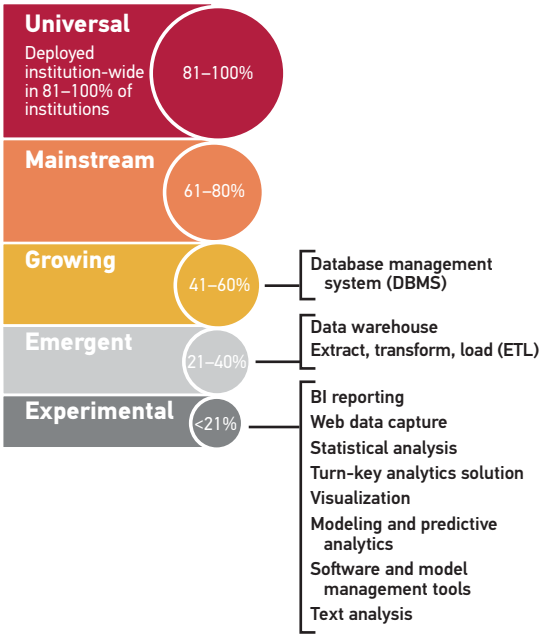

Figure 5. Current status of analytics deployment

The clustering of the technologies on the lower part of the deployment index scale is quite telling: Institution-wide deployment of technologies that support analytics is more the exception than the rule. Most of the technologies that support analytics are considered experimental, with fewer than 21% of institutions reporting institution-wide deployment. When targeted deployment of technologies is added to institution-wide deployment, four items migrate to mainstream status: database management system; data warehouse; extract, transform, load (ETL); and statistical analysis.

Moving from experimental to mainstream (to universal) will require significant investment in the resources that support (or grow) analytics capabilities in higher education. This provides a blue-ocean opportunity to bring affordable, quality analytics tools and technology products to market. Learning analytics is a major priority at about half as many institutions as is institutional (business) analytics, so investment in the technologies and tools that support institutional analytics will likely precede investment in learning analytics.[8] With sufficient funding levels for analytics hitting 2.8 out of 5.0 in the analytics maturity index, analytics leaders need to assess the value proposition of such tools and technologies and communicate the return on investment to campus leaders. Currently, low investment/resources scores from the analytics maturity index conceptually validate the deployment index findings. Analytics maturity and deployment are positively and significantly correlated: Institutions with higher maturity have generally also deployed more analytics technologies and services ($r = 0.58$). Greater investment will likely beget more of the technologies and tools that can mature institutional analytics capabilities.

Conclusions and Recommendations

Few will disagree that there is widespread interest in making the best possible decisions using the best possible information. Although individual institutions are making strides in analytics, these successes have yet to become replicable and scalable across the landscape of higher education. Creating the systems and culture to actually do this has proved somewhat of a challenge. Strengthening relationships between IT and IR can play a role in increasing support needed to push this new data-informed culture through planning and high-level strategic initiatives.

Investment/resources continues to be the lagging dimension in the higher education maturity index; this dimension includes investment in talent, technology, and tools to support or grow an analytics program. Committed leadership is essential for overcoming analytics investment challenges in an institution. Associate's institutions have demonstrated how collaboration among institutions has the ability to collectively raise the analytics bar. Moreover, many associate's institutions participate in Achieving the Dream, which calls on these institutions to form a joint commitment on student success. Such partnerships showcase the benefits of participating in an organized effort toward reaching those goals. Savvy analytics leaders will understand how to frame analytics funding as an investment rather than an expense. They will also understand the interaction of the institution's interests, priorities, and investments with the local conditions that hinder or foster progress toward an analytics capabilities strategy.

The EDUCAUSE maturity and deployment indices can help analytics leaders assess and document the state of analytics at the institution. An institution's maturity scores are evidence of current practices and can be compared with aspirational or peer practices. Assessing analytics maturity will also give the institution baseline metrics from which to gauge progress in maturity over time. Gone are the days of basing decisions on information generated exclusively from human advisors, common sense, intuition, and past experiences. These are important value-adds to decision making, but we are on the cusp of an era of analytics-driven, machine-generated advisory services supported by coders/programmers. Using benchmarking results to influence and persuade the institution's decision makers is an exemplary way to start or reinvigorate an institutional analytics strategy.

Acknowledgments

Much credit and many thanks are owed to Susan Grajek, Leah Lang, Eden Dahlstrom, Kate Roesch, and Gregory Dobbin, who all contributed substantial advice, effort, and expertise to this report.

Notes

1. Susan Grajek and the 2016–2017 EDUCAUSE IT Issues Panel, "Top 10 IT Issues, 2017: Foundations for Student Success," *EDUCAUSE Review* 52, no. 1, January/February 2017.
2. Jacqueline Bichsel, *Analytics in Higher Education: Benefits, Barriers, Progress, and Recommendations*, research report (Louisville, CO: ECAR, 2012).
3. The CDS survey is open annually to participating institutions July through December and provides data to track digital capabilities within higher education.
4. Eden Dahlstrom, *Moving the Red Queen Forward: Maturing Analytics Capabilities in Higher Education*, research report (Louisville, CO: ECAR, 2016).
5. Ibid.
6. Ibid.
7. See E-Learning Deployment Index detail.
8. Ronald Yanosky, with Pam Arroway, *The Analytics Landscape in Higher Education, 2015*, research report (Louisville, CO: ECAR, October 2015).

Appendix

Table A1 displays a provisional rubric of the six dimensions and their characteristics at each level of the scale. This rubric is based on a retrospective of 32 items in the maturity index and responses to them, but subject-matter experts have not validated the results.

Table A1. Analytics maturity dimensions and levels rubric (draft version)

Dimension	Absent	Initial	Developing	Established	Optimized
Data efficacy Demonstrates that policies and processes are implemented for institutional management of the quality, standardization, and validity of data and reports; ensures appropriate data management tools are available.	There is no intentional design to data gathering or formatting; data are not standardized, and data reports are not useful and not replicable. Data are neither accessible nor comparable across areas of the institution.	Data are siloed and incomparable due to discrepancies in format and definition; efforts are under way to identify current data sources, definitions of existing data, and access rules for existing data. Efforts are under way to establish goals for data collection. Data reporting is inconsistent and not replicable.	Existing data have been documented; goals have been established for the collection of new data. Efforts are under way to standardize data, clean data, and establish processes for making data more accessible; many departments are establishing data-quality standards and improving overall quality. Initial reports to inform decision making are being developed.	Data are purposeful, accessible, and of acceptable quality across the organization. Data are comparable for use within the institution and have limited comparability outside the institution. Report templates that include data to inform decisions have been established.	Data are of exceptional quality, with documented purpose and definitions. Data and reports are accessible and standardized to guide comparison across many dimensions, both within and outside the institution. Repeatable analytics, reports, and processes show the right data to inform decisions.

Cont'd

Dimension	Absent	Initial	Developing	Established	Optimized
Decision-making culture Advocates within the culture of the institution for the use and acceptance of analytics, including senior leadership commitment.	There is little public leadership or internal culture supporting the use of analytics. Analytics and data are not included in strategic planning or in institutional decision-making processes. Analytics is not part of any institutional big "win."	Select leaders have started supporting analytics internally, and some departments' cultures are becoming more data oriented. Faculty members in some departments are accepting analytics as appropriate in planning. Analytics is becoming part of the discussion when considering strategic planning, key institutional outcomes, and organization-wide decision-making processes.	Leaders are voicing their support for analytics; faculty members are starting to use analytics in their department plans and initiatives. Plans to tie institutional strategy and initiatives to analytics are under way; efforts have begun to create processes for moving from data to action. Leaders look to analytics when seeking to discuss big "wins."	Leaders, senior staff, and faculty publicly endorse analytics and provide internal support as well. The culture includes open discussion of analytics. Analytics is a regular part of faculty discussions and is used in departmental plans, as well as to demonstrate outcomes. Most planning and institutional initiatives are designed with analytics in mind; decision making is increasingly based on data; processes for moving from data to action are used with increasing frequency. Several large "wins" have been credited to analytics.	Institutional leaders and faculty publicly support the use of analytics by using them regularly in decision making, internal and external reports, and public speaking; there is a cultural expectation for the incorporation of analytics into decision making. Strategic planning and institutional initiatives are tied to key institutional outcomes that are tracked with data and analytics. Processes are in place to move from data to action; outcomes are improving due to data-informed decision making. "Wins" at the institution are often credited to the use of analytics.

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Dimension	Absent	Initial	Developing	Established	Optimized
Investment/ resources Develops and implements a financial plan to evaluate the return on investment for both personnel and analytics tools.	Staffing, infrastructure, and initiative funding are insufficient; discussions about analytics are focused on costs rather than return on investment. Resources and knowledge do not exist to effectively support analytics initiatives; training is not supported, leaving staff without current analytics knowledge.	Institutional analytics initiatives may be under consideration or in the early planning stages but are not yet funded or announced. Analytics interest and skills are growing among current staff; analytics training for current staff members is supported but limited; funding is not available for new analytics positions.	Initial analytics initiatives have been funded and announced. Personnel are being hired to fill new analytics positions, and training for current staff is more regularly supported because there is a budget for ad hoc training requests. As analytics expertise grows, some initial presentations are made to stakeholders and to the broader community that focus on visually intuitive and understandable analytics.	Based on the success of initial analytics initiatives, personnel investments and subsequent resource investments are dedicated to increasing analytics capacity. Some analytics support staff are in place; with increasing frequency, analysts present findings to stakeholders and to the broader community in a way that is visually intuitive and understandable. Select staff have opportunities to learn new analytics skills as part of annual budget cycles.	Analytics is supported and prioritized from both budgetary and personnel perspectives; funding levels for analytics are sufficient and viewed as an investment. The organization has sufficient numbers of trained analytics support staff who know how to apply analytics to their areas and present visually intuitive findings to stakeholders as well as the broader community. Analytics training is fully supported, and opportunities for staff to receive analytics training are integrated into annual budgets.

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Dimension	Absent	Initial	Developing	Established	Optimized
Policies Demonstrates an ability to create formal and informal policies at the department and institution levels regarding data collection, access, storage, and reporting.	The organization does not have appropriate information security and other policies in place regarding access to and the use of institutional data for analytics. The organization's institutional review board (IRB) does not have adequate policies in place to manage analytics-related proposals.	Limited information security and other policies are in place to govern access to information, but policies for the use of institutional data are sporadic and not transparent across the organization. The IRB has started to develop appropriate policies to manage analytics-related proposals.	Information security and other policies and processes are in place regarding access to and the use of institutional data. Work is being done to fully incorporate these policies and processes across the organization in a transparent manner. The IRB has sufficient policies in place to manage analytics-related proposals; however, policies and practices are inconsistently applied to analytics-related proposals.	Information security and other policies are sufficiently robust to safeguard data use for analytics. These policies specify rights and privileges regarding access to institutional and individual data. These policies are transparent; however, awareness of the policies throughout the organization is inconsistent. The IRB has appropriate and consistently enforced policies and practices for handling analytics-related proposals.	Information security and other policies regarding access to and the use of institutional data for analytics are explicit, transparent, available, and widely known across the organization. The IRB has clearly documented policies in place to manage analytics-related proposals. These policies have been used and enforced, and they have evolved as data needs and capacities change.
Technical infrastructure Builds an environment with the available analytics foundational tools and also establishes the capacity to store, manage, and analyze data.	The organization does not possess the tools, software, or capacity to store and use large volumes of data.	A few tools have been purchased, and software is maturing in order to store and use large volumes of data. Storage-capacity needs for the organization have been established, and plans are under way to increase storage capacity.	The right tools and software are in place but are not consistently deployed across the organization. Storage capacity is growing but still falls short of meeting the needs of the organization.	The right tools and software are in place for analytics and are consistently deployed across the institution. The organization has sufficient capacity to store, manage, and analyze current volumes of data.	The organization possesses state-of-the-art tools and software to use for large-volume analytics projects. Storage capacity is sufficient to support increasingly large volumes of data, and/or there is a plan to guide future purchases and support the evolution of the technical infrastructure needed to support analytics initiatives.

Cont'd

Dimension	Absent	Initial	Developing	Established	Optimized
IR involvement Establishes and maintains a collaborative working partnership with the IR organization.	IR and IT do not consult with each other on analytics capabilities or capacity. IR leadership is not involved in the planning processes for addressing high-level strategic analytics initiatives.	IR and IT have initiated collaborations on a few high-level analytics projects and/or organization-wide planning processes. IR leadership is aware of high-level strategic analytics initiatives.	There are regular, formal consultations between IR and IT on analytics capabilities and capacity. IR leadership is consulted on projects that contribute to strategic analytics initiatives.	IR and IT consult with each other both formally and informally on projects to increase their own capabilities and capacity. Input from IR leadership enhances the planning and strategic analytics initiatives of the organization.	IR and IT collaborate regularly on projects and share their analytics capabilities. IR leadership is integral to the planning process for addressing high-level strategic analytics initiatives.