

RESEARCH BRIEF

Year	Category	Value
2018	Category A	100
2019	Category A	120
2020	Category A	150
2021	Category A	180
2022	Category A	200
2018	Category B	80
2019	Category B	90
2020	Category B	110
2021	Category B	130
2022	Category B	150



Becoming a Data-Driven Institution

College Leaders Assess the Value and Challenges of Using Data to Make Strategic Decisions



THE CHRONICLE OF HIGHER EDUCATION.

Becoming a Data-Driven Institution

Having spent thirty years as a higher education administrator, I understand how incredibly important data is to support decision-making in higher education, whether those decisions be about how to allocate scarce resources, what degree programs to offer, or what the long-term aspirations of an institution should be. As Executive Education Advisor at Amazon Web Services (AWS), I now have the opportunity to work with higher education leaders throughout the United States and across the globe as they build out their institutional data strategies and apply the insights that come with well-architected analytics solutions to address persistent problems, innovate in teaching, learning, and research, improve student experiences and outcomes, and truly transform their institutions.

Having spent thirty years in higher education, I also have a lot of personal experience with the challenges that come with harnessing the power of data. AWS works with institutions like the University of Maryland – Baltimore County, Illinois Institute of Technology, and Portland State University to solve those challenges and manage the entire lifecycle of their data, from collection and ingestion to analytics and visualization to long-term archiving. Working with AWS, institutions are able to manage, govern, and derive insights from the vast amount of data they have, and to anticipate sources of data not yet in existence, all while having access to tools to help manage the cost of their data and analytics strategies.

Data is the key to digital transformation. AWS stands ready to help you and your team unlock your institution's full potential.

Sincerely,

Mark

Mark C. Hampton, Ph.D.

Executive Education Advisor, Amazon Web Services



“AWS is committed driving digital transformation in higher education with cost-effective, scalable and secure solutions that improve student outcomes and drive operation excellence.”

Mark C. Hampton, Ph.D.



Becoming a Data-Driven Institution

College Leaders Assess the Value and Challenges of Using Data to Make Strategic Decisions

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Contact CI@chronicle.com with questions or comments.

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EXECUTIVE SUMMARY



Today's higher-ed institutions have vast quantities of data at their disposal. That data can illuminate the paths to find new enrollment prospects; raise retention and better serve students; and create financial efficiencies and improve revenue.

Data and the insights it uncovers are now seen as essential to running higher-ed institutions. But college leaders' efforts to use data to make better-informed decisions have yet to instill widespread confidence.

A near-unanimous group of college officials — 97 percent — say institutions need to better use data and analytics



to make strategic decisions, according to a *Chronicle* survey of 452 college officials conducted in the spring of 2023.

The survey explored their views on the increasing use of data, how data is being put to use across college campuses, and where barriers to data lie.

Held online from March 20 to April 3, the survey was underwritten by AWS and asked for responses from officials at two- and four-year public and private colleges in the United States. A majority (82 percent) work in college administration, with directors making up the largest group.

The wait for data-fueled analysis and decision making on college campuses is over.

Following in the footsteps of corporations, sports teams, and the consumer economy, more institutions are embracing technologies that amass and analyze data that can help them devise better strategies. Colleges are now looking for ways to convert data into insights that will better fulfill their missions, run their operations, and guarantee their survival in an increasingly tough market.

Over the past five years or so, experts say, colleges have become much more likely to compile and analyze large data sets that give them a clearer picture of a host of functions — including how their enrollment and tuition levels stack up against peer institutions, and where their student-services resources are apportioned.

Spurred on by professional groups and technology companies, colleges have stepped up the purchase of platforms that can help them learn more from their data.

The value of data analysis is now reflected in the institutional hierarchy. Many institutions have placed data operations in the hands of some of their most powerful people, typically vice presidents or senior vice presidents, according to research by Educause, an organization that supports the use of tech in higher education.

And more colleges are hiring their first chief data officers, or opening institutional research offices, to devise uses for the data they gather from faculty, finance offices,

Over the past five years or so, colleges have become much more likely to compile and analyze large data sets that give them a clearer picture of a host of functions — including how their enrollment and tuition levels stack up against peer institutions, and where their student-services resources are apportioned.

governments, market studies, students, and other sources. Nearly all colleges — 97 percent — now have staff dedicated to some aspect of data analysis, [according to Educause](#).

That heightened emphasis has come, in part, in response to campus professionals' concerns about their ability to make solid decisions and advance institutional goals based on broad and considerable evidence, not anecdotes or expediency.

Nearly four years ago, organizations representing campus finance officers, institutional researchers, and tech professionals issued a [clarion call](#) for colleges “to reaffirm higher education’s commitment to the use of data and analytics to make better strategic decisions.”

Using data “paves the way to developing new, innovative approaches for improved student recruiting, better student outcomes, greater institutional efficiency, and cost-containment,” the report noted.

At the time, colleges were “still struggling to take decisive action on analytics,” says the report, which was published by Educause, the National Association of College and University Business Officers (NACUBO), and the Association for Institutional Research, a group that advocates the use of data, analytics, information, and evidence to make decisions that are effective and ethical in higher ed.

But times have changed. As institutions recover from lower enrollment numbers and other financial threats that arose during Covid-19, they must also continue preparing for another projected enrollment downturn, the looming “[demographic cliff](#).” They must also answer concerns about educational equity and calls by parents, politicians, and others to be more open about the return on investment students can expect from a college education. Many are turning to data-crunching to provide clear and in-depth responses to the public.

And yet, making a big move toward becoming a data-driven institution comes with many challenges, which colleges often struggle to meet. Despite a bounty of tech products — including enterprise-resource-planning platforms,

learning-management systems, and student-information systems — colleges' need to compile, coordinate, integrate, store, and use data across all those programs remains a headache.

In [a study](#) published late last year, researchers at the Massachusetts Institute of Technology and the University of California at Los Angeles found that higher education has lagged behind business, industry, and government in its sporadic attempts to integrate data systems and reduce redundancies. What's more, even when data is crunched in a way that makes it useful, silos and other cultural issues at colleges have often prevented the broad sharing of data across all academic departments and offices.

Only one in four college officials says the current information infrastructure at their institution operates ideally for data and data analysis, according to [a February poll](#) by Educause. (And 58 percent say those data functions are not ideal.) Only 16 percent say that data operations on their campus function cohesively and collaboratively.

Data curation presents another challenge. Some institutions have tried repurposing some tech platforms designed for one type of data for use with other data sets. The result is often confusion or unreliable information. Because data curation is expensive and labor intensive, experts worry that colleges may not give it proper attention, even as they ramp up their overall data operations.

As more colleges enter the realm of Big Data and analytics-driven decision making, they have been forced to learn on a curve. They must navigate concerns over data governance and privacy, particularly regarding student data, as well as worries about the ethics surrounding the algorithms that underpin artificial-intelligence programs. Some AI systems have perpetuated ethnic or gender stereotypes and inequality on campus because of flawed algorithms.

And the overall cost of mining and picking data apart remains a concern for budget-strapped institutions. Though Educause and other groups encourage colleges to make substantial investments in the money, talent, and

time it takes to develop a comprehensive data operation, institutions face other financial concerns that can prevent them from making meaningful investments.

Larger colleges might be able to afford data systems and ways to link them that smaller ones cannot, creating a haves-have-nots scenario that may reduce educational opportunities for students and spell doom for institutions of lesser means.

Though creating a data system that works is an arduous task, there remain plenty of reasons for hope. Colleges often maintain what Educause calls “pockets of excellence” in data analysis. Those innovative departments and offices can serve as models for others across campus.

And, as many colleges ramp up data-science programs for their students, to meet the rapid growth of the field, they are becoming acutely aware of the need for data workers of their own: staff who can help them mine the ore and process it to find the crystalline insights that can point the way toward stronger decisions and, ultimately, better institutions.

As more colleges enter the realm of Big Data and analytics-driven decision making, they have been forced to learn on a curve.



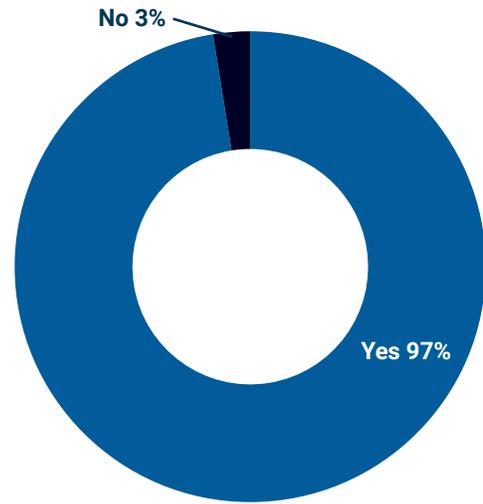
Using
Data, Not
Anecdotes,
to Drive
Decisions

Broad agreement exists among college officials about the value in finding better uses for data and converting those results into solid, evidence-based decisions. Nearly all survey respondents (97 percent) agree that higher education needs to become more data driven.

When asked why they think that way, many officials said that colleges have traditionally relied on isolated narratives or unproven ideas. “Too many decisions are based on anecdotes or individual cases instead of data,” wrote one college leader.

Better data would help staff members do their jobs better in several areas, officials say. Very high numbers of college officials cite a need

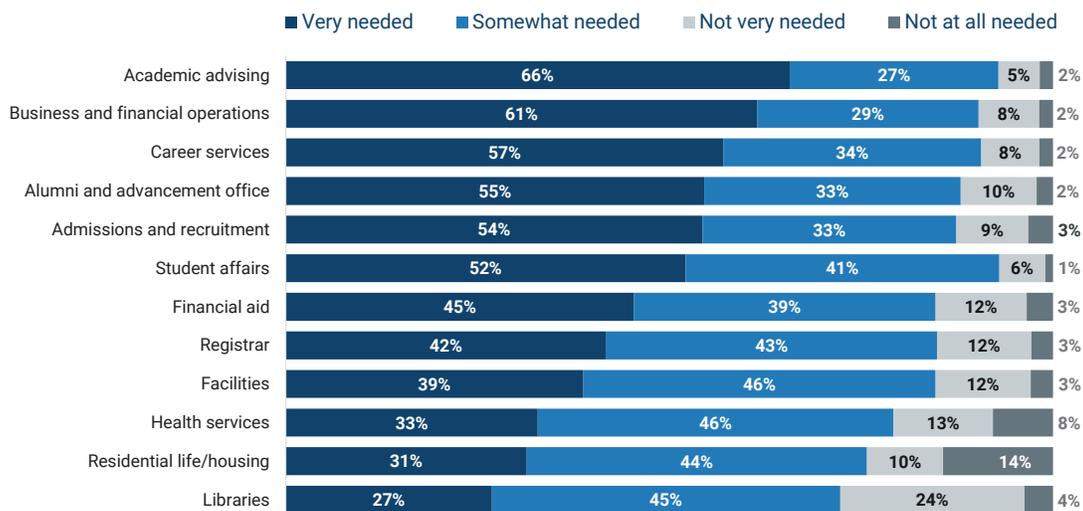
Do you agree that higher education needs to better use data and analytics to make strategic decisions?



Source: Chronicle survey of 452 college officials.

for better data in academic advising (93 percent), student affairs (93 percent), career services (91 percent), and business and financial operations (90 percent). Five other

Please rate where better data is needed at your institution.



Source: Chronicle survey of 452 college officials.
Note: Percentages do not total 100 percent due to rounding.

categories garnered responses of 84 percent or higher.

College leaders also largely agreed that corporations are well ahead on the use of data, with nearly three in four (73 percent) saying that institutions of higher education trail them.

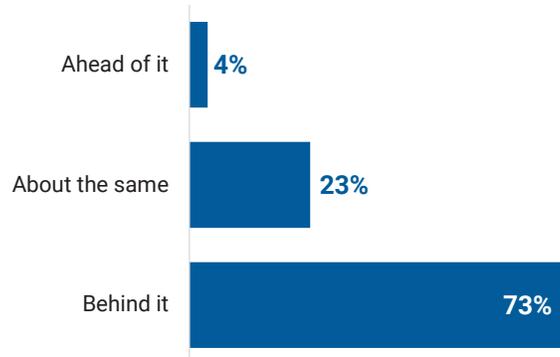
But leaders are less unified on several other questions. About half (56 percent) say their institution makes data-informed decisions at a rate similar to other institutions. The same percentage agree that their institution does a good job using data as a basis for strong decisions. Only 5 percent strongly disagree — possibly a sign of a change in culture among institutions.

“That number is amazingly low,” says Bryan Alexander, an adjunct professor and futurist at Georgetown University, who studies how technology transforms education. “I can’t imagine seeing a number like that even a few years ago. People are excited seeing how data is being used around the world. We’re immersed in it, and the advantages to colleges are pretty clear.”

Over all, survey results show that colleges are about midway through a transition to a data-centric era, he adds.

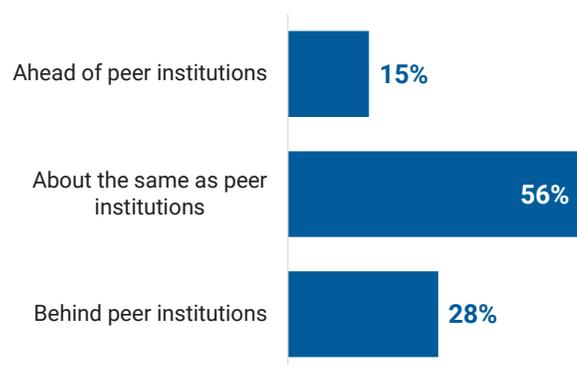
“Those near 50/50 splits in the survey tell us something. We’re looking at a snapshot of a moment right now. Colleges that didn’t think all that much about data analysis are now much more open toward it, and

Where does higher education stand compared to the corporate world when it comes to using data to improve its operations and serve its mission?



Source: Chronicle survey of 452 college officials.

In general, how would you rate where your institution stands on making decisions that are informed by data?

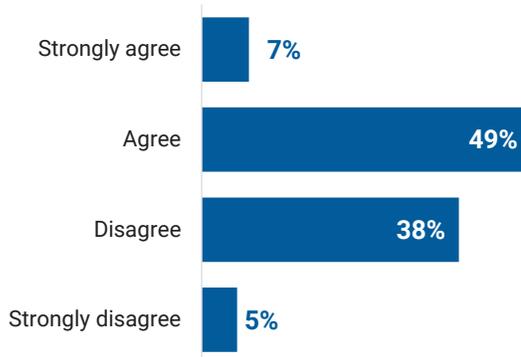


Source: Chronicle survey of 452 college officials.
Note: Percentages do not total 100 percent due to rounding.

many are now trying to figure out what to do with it,” Alexander says. “We’re heading toward Moneyball” — the data-driven management strategy used in Major League Baseball, as described in Michael Lewis’s famous [book](#) — “but we’re not quite there yet,” he adds.

The traditional ways of running a college are undergoing a vast cultural

How much do you agree with the following statement: “My institution does a good job of using data to inform our decision making.”



Source: *Chronicle* survey of 452 college officials.
Note: Percentages do not total 100 percent due to rounding.

shift based on data analysis — one that will take time.

“Higher ed has been driven by anecdotes for so long, and data-informed decision making is so new, that it may take people a while to figure it all out,” says Betsy Reinitz, director of the CIO and senior-technology-leaders program at Educause.

Others worry that colleges are making that transition too rapidly. Colleges are seeing the potential of using

Big Data but aren’t prepared to understand it before relying on it quickly.

“It’s bandwagon-esque,” says Colin Koopman, chair of the department of philosophy at the University of Oregon, who studies the ethics surrounding technology use. “People want to jump on it. But the question colleges should be asking themselves is, Will they be able to adjust our data course when they need to? As it stands now, too many colleges are moving too fast, and without the understanding of what effective data use and curation entails.”

While concerns about the pace of change are well founded, Reinitz says, nearly 60 percent of institutions contain departments or offices that represent data-savvy models — ones that can accelerate a college’s data transformation by informing other departments about best practices and warning them about trap doors.



Putting Data to Work Across Campus

To get the most of their data, institutions must do more than gather, store, and analyze it. To be valuable in major strategic decisions, data must travel freely between a variety of departments and offices. College officials are divided over whether their institutions are doing a good job of amassing and sharing data.

A majority (55 percent) of the officials surveyed says that their college maintains a campuswide program to

collect data and incorporates the results into its decision making.

Colleges that have done so have created a variety of functions and partnerships that cut across departments to collect data, according to survey respondents, including campuswide data-governance programs, leadership councils focused on data gathering, and data-driven programs in enrollment and retention.

However, most (55 percent of respondents) say their institution falls short when it comes to sharing data across departments.

When asked to elaborate, college leaders cited poor communications, departmental silos, and competition among offices for technology grants.

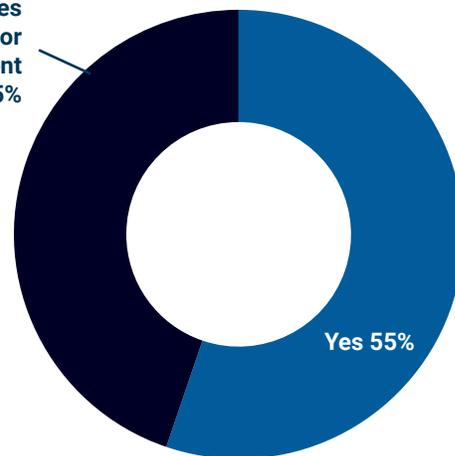
Experts point to shortcomings in college culture, resources, and tech integration.

“For 200-plus years, Ohio University functioned without data,” says Loralyn Taylor, associate provost for institutional research and effectiveness at the institution. “It’s hard to explain to people how valuable comprehensive and well-distributed data analysis can be when they never needed it before.”

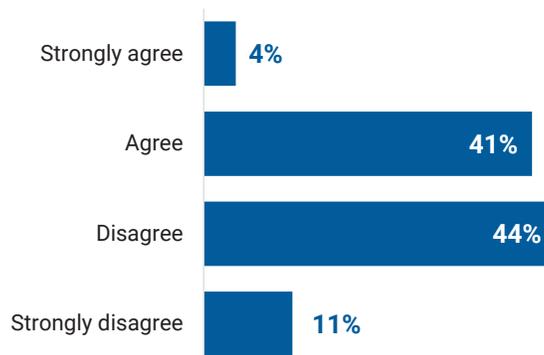
Data can seem proprietary to some leaders and staffers who have it, says Sujoy Das, vice provost for institutional research, assessment, and accreditation at Drexel University. “There’s a bit of politics in it — ‘this is my data, and that’s yours.’ It’s a cultural issue that holds back the

Is there an institutionwide effort to improve data collection and encourage the use of data in decision making?

No, it varies by office or department
45%



How much do you agree with the following statement: “My institution does a good job of sharing data between offices or departments.”



Source: Chronicle survey of 452 college officials.

potential of all the data, which of course belongs to the institution and not one department,” he says.

Colleges might spend a good bit of money on different tech systems, but they don’t do enough to link them so they can meaningfully collate and compare a wide variety of data. A tangle of tech platforms plays a

role in slowing the flow of data from office to office.

“Admissions uses Slate, the registrar uses Banner, student services uses Salesforce, student affairs enters student data into Maxient,” wrote one respondent to the *Chronicle* survey. “Academic advisers enter advising data into uConnect, housing uses their own platform. We have multiple texting platforms. The list goes on. There is so much data being collected but very little being strategically used and shared.”

The issue isn't so much the number of systems a college maintains, but how it connects them. Institutions might have enterprise-resource-planning platforms, learning-management systems, and a customer-relationship management tool, “but these may not link up well,” says Brent Drake, senior vice president for operations and research at the John N. Gardner Institute for Excellence in Undergraduate Education. “Tech vendors will say that their tool allows for

reporting. But it's not really true. Their product might offer reporting on its one functionality, but it often won't solve the problem of reporting across platforms.”

Though more colleges are hiring chief data officers and staffing institutional research offices to deal with challenges like those, too few senior leaders understand them, some experts say. People at the top might be all in on data, and yet they may have little idea of how to convert it into winning strategies. Institutions that value teamwork often lack the data structure or stakeholder buy-in that would make analysis more useful.

“When your leadership isn't aligned, you can't align on data collection and sharing,” one college official says. “One of the biggest challenges I have seen is that leadership also picks and chooses what data they share or use in certain cases. That causes trust issues and challenges for the work force.”

When asked to name the biggest barrier to using data effectively, the

“Admissions uses Slate, the registrar uses Banner, student services uses Salesforce, student affairs enters student data into Maxient. Academic advisers enter advising data into uConnect, housing uses their own platform. We have multiple texting platforms. The list goes on.”

largest number of college officials (23 percent) cited decentralized and siloed data collection over budget constraints (18 percent), difficulty turning data into action (15 percent), and inadequate data governance (11 percent).

Experts say that using a decentralized approach to data reflects an old way of doing business. Colleges have traditionally seen dispersed management of departments and offices as a major plus for academic freedom and managerial autonomy. But making a data strategy via a central office or campuswide entity could go a long way toward making sure institutions get the most out of data, some experts say.

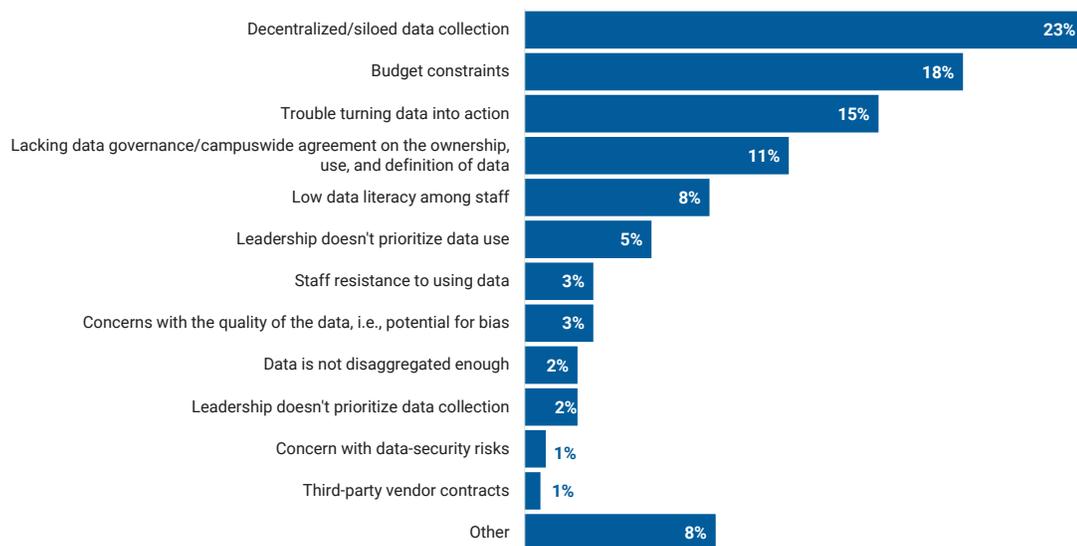
Some institutions, such as Ohio University and the University of

North Texas, use institutional-research offices as hubs for regular training sessions, done both individually and in groups, that cover data governance, privacy, and security. While ongoing, sessions are emphasized whenever a new tech tool or linkage system is introduced.

At North Texas, training sessions available online began about a year ago. They start from the top down — from the president to cabinet members to deans to faculty members. As soon as someone signs on for training, the university asks them to refer a colleague.

“We’re trying to make data literacy a regular function and expectation across campus,” says Jason Simon, associate vice president for data, analytics, and institutional research

What’s the biggest barrier on your campus to using data effectively to make decisions and improve operations?



Source: Chronicle survey of 452 college officials.

at North Texas. By making data training widely available, the university works to break down barriers between departments, he says.

Simon, Taylor, and others profess a need for more “data champions” — people who understand how a well-coordinated data-analysis program can improve an institution — across campus. Those people can persuade people to break down

walls between offices and share information. “We need better storytellers,” Taylor says.

“Even though we see pockets of excellence at some institutions, colleges need a shared sense of goals and a shared language regarding data,” adds Lindsay Wayt, senior director of analytics at NA-CUBO. “We’re not there on culture change yet.”



Symbol	Price	Volume	High	Low	Open	Close
876821 - 129.45	129.45	5078	130.00	128.00	129.00	129.45
839891 - 988.01	988.01	6032	990.00	985.00	987.00	988.01
345091 - 112.22	112.22	6023	113.00	111.00	112.00	112.22
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345091 - 112.22	112.22	6023	113.00	111.00	112.00	112.22
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839891 - 988.01	988.01	6032	990.00	985.00	987.00	988.01
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Data entry. Starting calculations based on the data.
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Coordinates are calculated and unloaded to the server. The data is shown on the screen. Updating user request data.
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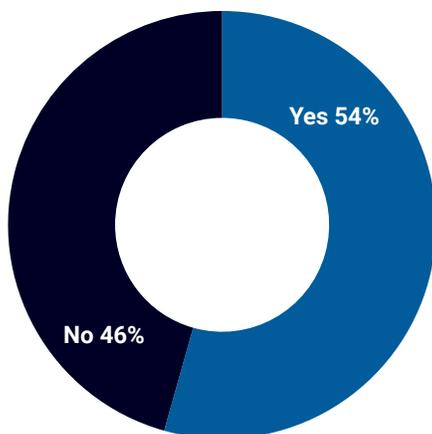
Focusing on Barriers to Effective Data Use

Along with campus culture, institutions face other formidable barriers, especially when it comes to money. Considerable initial outlays for a variety of tech platforms too often don't add up to data that can offer strategy-changing insights, experts say.

Colleges need to pay for more tech professionals who can stitch together the scattered patchwork of data sets on campus, says Drake, from the Gardner Institute. *The Chronicle* survey found that slightly more than half (54 percent) of colleges have hired a chief data officer, while about the same number (51 percent) of departments or offices have emphasized data skills when hiring new employees.

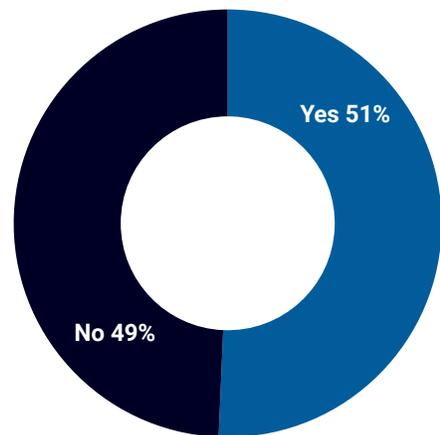
Less than half of offices or departments (44 percent) have brought on a new staff member whose primary focus is on data, however.

Does your institution have a chief data officer or equivalent role?

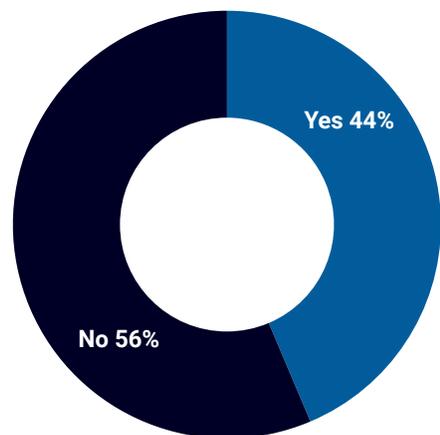


Source: *Chronicle* survey of 452 college officials.

Within your office or department, have you hired new staff members with a greater emphasis on skills related to data, such as data analysis?



Within your office or department, have you hired a staff member whose primary focus is on data, including data collection, data governance, and analysis?



Source: *Chronicle* survey of 452 college officials.

Budget-minded institutions may not be able to afford to hire enough outside data scientists to fill the need. Corporations pay tech pros more than many colleges can muster. Because of that, emphasis has been placed on training existing employees.

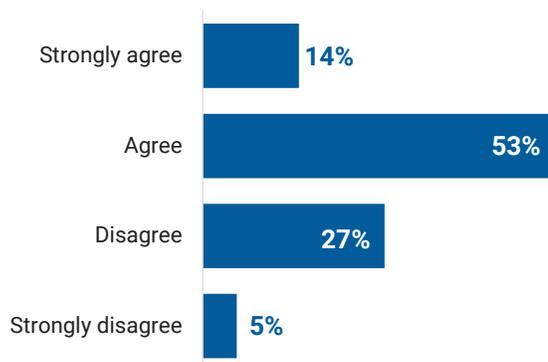
Most college officials (67 percent) agree that their institution employs staff members who are well versed in using data. A larger number (71 percent) have trained people already on staff to build up their data skills. More than half (55 percent) of the institutions who upskill their employees offer them training on a voluntary basis, sometimes while offering incentives.

“Training our own people is valuable because it takes the resources we have and makes them more efficient,” says Simon, from North Texas.

But hiring from inside isn’t a perfect solution to a college’s resource issues regarding data. While staff members may benefit from data training, many are stretched thin. “Data-analysis teams are understaffed and overwhelmed,” says Reinitz, from Educause.

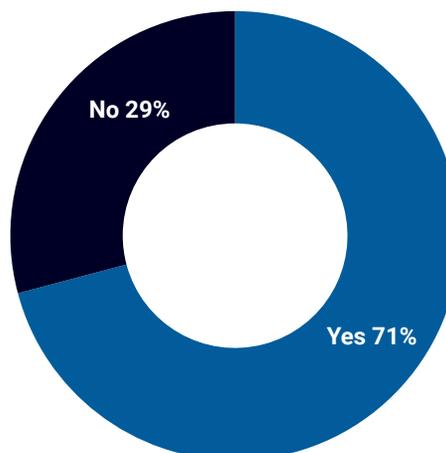
Hiring has suffered because of fiscal concerns. And while data analysis has college officials’ attention these days, it has yet to gain a seat at the leadership table. Only about one in three (37 percent) of institutions that maintain

My institution has staff members who are well-versed in using data to do their jobs.



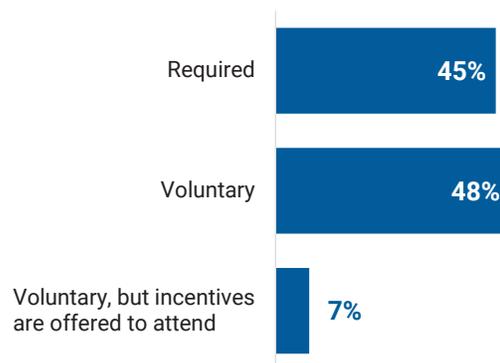
Source: *Chronicle* survey of 452 college officials.
 Note: Percentages do not total 100 percent due to rounding.

Within your office or department, have you trained existing staff members to build skills related to data?



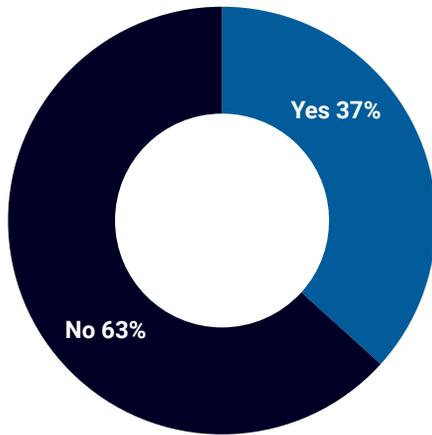
Source: *Chronicle* survey of 452 college officials.

Is the training ...



Source: *Chronicle* survey of 452 college officials.
 Note: Only those who indicated they have trained existing staff members to build skills related to data were presented this question.

You selected “Yes” to the question: Does your institution have a chief data officer or equivalent role? Does this official sit on the president’s cabinet?



Source: *Chronicle* survey of 452 college officials.

a chief data officer has placed them on the president’s cabinet.

Experts had conflicting opinions about whether a cabinet seat would help leaders grow and improve use of data analysis across an institution. Some, like Drake, wondered whether colleges were taking data and the vital function of data officers seriously enough. Others, like Alexander, from Georgetown, believe data officers’ time would be better spent across campus explaining the benefits of data and how to analyze them than sitting beside a college president.

Financial shortfalls may also be leading college officials to cut corners on data-integration plans. One key to such plans is data curation: how data sets are organized and maintained so they can be useful to people seeking information.

Data from one platform can be misused when it hasn’t been properly analyzed, coded, or translated to another platform. When a state university recently tried to assess how many publications faculty members were producing, it used a piece of analytics software that sought out only the publications listed in a public database. Faculty members felt shortchanged.

“We’re at a moment when coding and algorithms are sexy in higher ed, as they were in Silicon Valley, and data curation is not,” says Koopman, from the University of Oregon. “Often, the limitations we see aren’t in the data themselves but in how little higher education is putting into handling them.”

Data curation “is sheer, exhausting labor,” Koopman adds. “When you don’t put the money and work into it,

“We’re at a moment when coding and algorithms are sexy in higher ed, as they were in Silicon Valley, and data curation is not. Often, the limitations we see aren’t in the data themselves but in how little higher education is putting into handling them.”

you'll increase the chance you'll end up with bad information, and possibly treat your students unequally."

AI has already been linked to inequality in student treatment, such as when students of color are treated differently from white students by software that monitors their academic progress. If not developed with more sensitivity, algorithms that view females and people of color differently from white males could affect the pace of culture change on campus.

"There's a lot of anxiety about AI slowing this march to data," says Alexander. "We might see things slow down once we expect faculty to get on the data bandwagon."

While data analytics holds a store of fresh promise for institutions seeking solutions during challenging times, they won't ever be able to answer every question or develop in a predictable, linear way, some experts contend.

"Some people expect too much from data," says Wayt, from NACUBO.

"Some people expect too much from data. Its best use is as part of a strategy. Investing in the right ERP or LMS or dashboard tool won't solve the challenges of higher ed. There is no magic button."

"Its best use is as part of a strategy. Investing in the right ERP or LMS or dashboard tool won't solve the challenges of higher ed. There is no magic button."

Leaders who use data analysis effectively, perhaps even transformatively, will come to see it as one instrument in a kit of decision-making tools. "Data provides a menu of options," Wayt adds. "But it's still up to human beings to make decisions that lead a college's mission, staff, and students to success."

CONCLUSION

Institutions are in the midst of a data transformation. Most college leaders now realize the need for better data that drives well-informed and evidence-based decisions — ones that transcend anecdotes and past practices.

They believe that useful data should be applied to a variety of college functions — everything from advising to business operations to career services to student affairs.

But growing pains remain. Only about half of college officials say their institutions do a good job of using data to guide leaders' decisions, maintain a campuswide effort to improve data collection, or share data among offices and departments.

Campus culture, data integration, and a lack of resources represent barriers to progress in data analytics. Siloed academic departments and operations offices, leadership that struggles with deeper data issues, and underdeveloped strategies on using data to make transformative change are serving as a drag on progress.

Campus culture, data integration, and a lack of resources represent barriers to progress in data analytics.

Though many colleges have invested in several types of technology platforms, they have yet to uncover their full potential. Integrating those systems so they will produce data that leads to decisions that will strengthen institutions will be key in the future, as will identifying people who can speak to the power of data and why it should be used to improve operations across the campus.

Money remains a major issue. To deal with tight budgets, more institutions are training existing employees on how to understand and use data instead of hiring tech experts from outside. The advent of more chief data officers and institutional research offices indicates that colleges are developing more infrastructure as they move deeper and more quickly into the era of Big Data.

METHODOLOGY

The Chronicle asked officials at two- and four-year public and private institutions in the United States to answer a 20-question online survey; 452 responded. Nearly all (99 percent) work full time.

A majority (82 percent) work in college administration, with directors constituting the largest group (26 percent). Others represented include provosts (15 percent), vice presidents (14 percent), presidents or chancellors (7 percent), finance officers (6 percent), human-resources officials (5 percent), and tech officers (4 percent).



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