

The democratization of data in higher education:

A case study of the challenges that institutions face as they seek to improve student success

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Introduction

A combination of external and internal forces—including increased interest in measuring student success—is pressuring colleges and universities to reconsider not only who needs access to what kinds of information, but also how data and information are used in decision-making. In the past, on-campus requests for data and information about enrollment levels and student demographics, for example, had to be routed to the information specialists who had the expertise to “run the numbers.” After several days, weeks, or months, these experts would report the findings back to those who were providing academic instruction or other services to students. In many cases, from the perspectives of those making decisions about services and programs, the most important data were not available either because the information systems had not been set up to collect and compile that kind of data, or because the systems could not deliver the data in a timely manner before decisions needed to be made.

Today, however, many colleges and universities grapple with opportunities to increase data availability to administrators, faculty, and staff in order to empower them to make data queries from their desktops, to provide them with avenues for sharing that information with others on and off campus, and to assist them in using such data to serve students more effectively. By making data more accessible and usable to broader numbers of people, colleges and universities can provide deans, program managers, administrators, faculty, counselors, and others with the information they need to achieve program improvements. The idea is that by equipping people at all organizational levels with the data they need, colleges can enable individuals to make better day-to-day and long-term decisions about how to reach and serve students.

Yet, making data available to broader numbers of people brings with it a host of challenges for colleges and universities. For example, it requires a significant investment in a college-wide information technology infrastructure—often a difficult investment given limited

funding levels. Moreover, successfully implementing college-wide information technology systems requires convincing prospective users from a wide range of departments and institutional levels to work together to determine, for instance, which kinds of data to track, what kinds of reports to generate, and what levels of access are needed for which job positions. It could mean, for example, making budgetary data available to faculty so that they know how much an additional course section costs, or making outcomes data available to counselors so they can compare student goals with actual performance. Making data available to broader numbers of people requires having administrators who will support new mechanisms for investigating student achievement. This might include developing a new understanding of student success as opposed to penalizing programs that do not meet particular objectives. Also, privacy issues about data are inevitably raised and need to be resolved. As inevitable, existing organizational dynamics within the institution are disrupted, as the jobs of those responsible for managing information flow are threatened. In short, making data available to broader numbers of people changes the way that colleges and universities have traditionally done business.

However, the truly empowering and transformative prospects of what we call the “democratization of data” do not derive from simply increasing access to data. Rather, they derive from the information sharing and deliberative processes that ensue from data usage. As more administrators, faculty, and staff gain ready access to data, they inevitably struggle with the challenges that accompany organizational reflection and evaluation. Are other programs on campus running more efficiently? Are they reaching more students? So long as there is a campus culture that supports improvement, and so long as people begin to feel comfortable with the accuracy of the data they receive, they can develop more probing kinds of analysis. For example, they might explore the effects of certain programmatic offerings or student interventions at various junctures in a student’s course taking. This kind of inquiry and exploration can be a powerful way to bring about organizational improvement. Yet, it can also be very threatening to those who have grown used to, or benefit from, the status quo. Moving toward this level of organizational reflection, or culture of inquiry, requires the creation and nurturing of an organizational culture that emphasizes and rewards inquiry and improvement.

The Democratization of Data

The forces that have opened opportunities for the democratization of data can be grouped in four areas. First, there has been a shift away from considering technology implementation as primarily a series of technical issues and toward considering it within the broader, human dynamics of organizational culture and processes. Technology systems do not exist in a vacuum. Rather, these systems are embedded within organizational structures and processes that influence technology use, information sharing, and attitudes about the use of data and information in decision-making. This shift in thinking has emphasized the needs of users of technology rather than the power of system capabilities.

Second, largely because of technological advances, lay users who would like to access data directly and to perform their own data searches no longer need to be sophisticated technology users to do so. Many colleges and universities now provide users with direct access to a wide range of student, financial, and other data on their desktop. Faculty can access and grade student portfolios online. They can download class lists. At key points in the semester, faculty can automatically generate letters to students who fall below a certain threshold and need additional help, such as tutoring or counseling. And, faculty can perform data queries, such as investigating the success rates of English language learners in various classes or within specific majors. That is, technological advances, combined with effective information-sharing policies and practices, have made it possible to increase the availability of data for those institutions that are able and willing to make the investment.

Third, public sources outside of higher education are placing increasing demands on colleges and universities to improve quality, productivity, and effectiveness. This trend is ratcheting up the pressure on colleges to track and provide information that can be directly linked to student outcomes, such as the percentage of students who persist past the first year of college and who receive certificates and degrees in a timely manner. During the past decade, more state legislatures throughout the United States have sought to use such performance measures as a means to allocate funding to postsecondary institutions. Accrediting agencies, likewise, have been asking colleges and universities not only to measure and track student outcomes, but also to demonstrate how they use such outcome measures to improve instructional programs and

services. In short, demands for improved information about student outcomes in higher education appear to be on the upswing and show no signs of abatement.¹

Fourth, within higher education there is an ongoing interest in the use of data for decision-making, both as a means to measure and improve student achievement and as a way to track and promote progress toward institutional goals. Many within higher education see effective use of data and information as a way to raise performance, productivity, and outcomes at all levels.² Institutions that collect and use data on student performance can make proactive decisions about investments in programs and services, can target student and community needs, and can eliminate duplication in programs. These institutions can also respond more effectively to demands for information from state legislatures, system-wide offices, and other external bodies.

Given the robust technological capabilities now available, colleges and universities that seek to understand and improve their rates of student success will inevitably confront—either deliberately or unwittingly—their own institutional practices and attitudes concerning access to and use of data. What measures of student success are now being tracked, with what kinds of disaggregations? Who should have access to which data? How should such data be distributed? For what purposes? With what levels of support? Of course, no best way exists to answer these questions; some institutions have sought to expand access to data and information through enhancing technological capabilities, while others have hired more institutional research personnel. In describing some of the major challenges that one institution faced as it made these kinds of decisions, this paper outlines an investigative process to consider when seeking to improve student success and organizational effectiveness through the democratization of data. This process includes the following areas of inquiry:

- **Identify the primary needs for data and information at a wide range of decision-making levels.** How have data needs changed at various levels of decision-making on campus?

¹ Ewell, P. T. An emerging scholarship: A brief history of assessment. In T.W. Banta (Ed.), *Building a Scholarship of Assessment*, San Francisco: Jossey-Bass, 2002, pp. 3-25. Also, Miller, M., “Measuring Up and Student Learning,” in *Measuring Up 2002: The State-by-State Report Card for Higher Education* (San Jose: National Center for Public Policy and Higher Education, 2002), pp. 69-72.

² Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 1, 32-42.

- **Examine the adequacy of the information structures and processes currently in place.** How does information flow within the organization? Do people think they are getting the data they need to perform their jobs? Where are the significant gaps between needs for data and the information system’s ability to deliver that data?
- **Consider the incentives and disincentives for data use implicit in the campus information culture.** Do managers, deans, senior faculty, coordinators, and vice presidents ask for data when they make their decisions? Do they support processes for data gathering and analysis in other ways as well? Are data used to punish programs or to explore program improvements? It could be that changes in formal and informal processes can improve data use without investing in a new information system.
- **Examine how people are responding when they can’t get the data they need.** One consequence of inadequate information flow is that people “work around” their lack of data support. For instance, they gather their own data or create their own databases. Those who are engaged in these kinds of practices have already identified where information gaps may exist on campus. Moreover, they may be a promising group to get on board.
- **Investigate the full costs of *not* providing greater access to data and information.** There are ongoing and significant, though largely hidden, costs associated with *not* providing access to data and information. These costs can be considered alongside the costs of investing in a new system when such issues are on the table.

After exploring the data challenges that one institution faced as it sought to improve its services and outcomes, this paper suggests several implications of this data environment for state and institutional policy.

The Research Context

The findings and analyses in this paper derive from 18 months of study that began in January 2000 at a community college district in California—a large, multi-campus, suburban district with a combined enrollment of more than 45,000 students. The research focused on data and information gathering, analysis, sharing, and use in decision-making in the district through direct assessments, surveys, and interviews focusing on the capabilities of the information

system, the reach of the internal research function, and perceptions of unmet need. Our research team took part in more than 200 meetings as participant/observers; conducted more than 70 formal and informal interviews with a cross-section of administrators, faculty, and staff; and conducted 49 in-depth interviews with a non-random sample of administrators, faculty, and staff. We also conducted a survey of 250 administrators, faculty, and staff about their use of data and information. Although the findings and analyses in this paper draw from, and are based on, the specific contexts of this community college district, many readers will undoubtedly recognize features of their own community college or four-year institution in these descriptions.

The Primary Needs for Data at a Wide Range of Decision-Making Levels

One of the first series of challenges that many colleges and universities face when considering how to improve their academic and student services is understanding the kinds of data that people need to perform their jobs effectively. This means shifting the emphasis away from assessing the technical capabilities of information systems and instead emphasizing and understanding the current needs of users. This involves a new focus on the requirements of various staff, faculty, and administrators and the problems they are trying to solve. One way to advance this process is to perform an information audit on campus.

At the community college district discussed here, we performed an information audit that included a series of interviews with campus personnel at various levels to determine their primary data behaviors and needs as well as the kinds of data they needed in an ongoing way. Based on this audit, we found that, given the demanding context of public higher education, there were significant and growing needs for data and information at all levels of decision-making throughout the organization. For example, we found that district and campus administrators were acutely aware of their limited fiscal resources. They were very interested in obtaining a better understanding of the range of impacts that resulted from various services and interventions so that they knew where best to invest these limited resources. For example, they wanted to know which groups of students were accessing which kinds of academic support services, for what duration, and with what results. They also sought to find out which of the many student retention programs were achieving the best outcomes in helping students reach their goals. As another example, given the opportunity to increase spending to improve persistence rates of low-income students, district and campus administrators strove to better understand the impact on student

learning outcomes of hiring an additional academic counselor compared to an additional tutor or instructional aide in the classroom.

Meanwhile, department heads, faculty, and staff required a wide range of data and information that could identify and help address student performance differences in the classroom. For example, they wanted to be able to disaggregate findings by various student groups, including ethnicity and primary language, and they wanted to know the relationship between course-taking patterns and student success. Deans were particularly attentive to large increases or decreases in student enrollment, which alerted them to possible changes in student demographics. Faculty and staff were very interested in having data available to effectively match students with appropriate services and interventions, including the ability to track students' educational goals. Counseling staff desired quicker access to up-to-date student records to give more relevant and timely advice to students.

At the same time that administrators, faculty, and staff are seeking data to improve services and student outcomes, they also need to respond to a wide range of external demands for data—demands that appear to be increasing nationwide. Administrators typically require policy and planning data to answer questions from state funders and other external bodies. Meanwhile, departments and programs are generally responsible for reporting on day-to-day operations. As states have demanded greater levels of accountability and have mandated that specific performance measures be met, many colleges and universities have passed along these demands for information to administrators, faculty, and staff—sometimes with additional support to meet these needs, and sometimes without. From time to time, it is important to reassess the amount of administrative, faculty, and staff time being expended on external reporting requirements. For example, are there time-consuming tasks that could be automated? Are administrative duties regarding data compilation and reporting draining academic resources? In considering the information needs on campus, it is also crucial to consider the extent to which externally imposed demands for information conflict or align with internally driven requirements. For example, are people being required to compile the same data in several different ways to satisfy a wide range of data definitions? Could internal requirements be revised to better align with external mandates?

The Adequacy of the Information System and Internal Research Function

A wide range of educational institutions—large and small, urban and rural, public and private—do not adequately support the information systems and internal research functions that are required to meet the needs for data and information on campus. One consequence is that these colleges and universities are unable to fully address the challenges of managing and using data for effective decision-making, which can in turn lead to significant difficulties in assessing programs and improving rates of student success. For those colleges and universities seeking to improve their rates of student success, it is important to identify the key information gaps on campus—the mismatches between the kinds of data that various staff, faculty, and administrators need to perform their jobs, and the institution’s ability to provide that information in a timely way.

Our research confirmed that the technological and internal research structures were insufficient to assist employees as they performed the basic decision-making functions of their jobs. As with many other colleges and universities, this district’s technological infrastructure was not integrated from one department to the next. That is, it consisted of several separate, “flat,” non-relational databases that did not “speak” to each other. In order to generate useful information from the databases, the colleges maintained a host of separate software programs to extract and organize data. Users who attempted to access data directly from the system had to regularly maneuver across more than one technology, producing a multi-step process of data retrieval that required time and considerable expertise with a variety of software applications. This became an obstacle for many prospective users.

In addition to having to maneuver through cumbersome processes for data retrieval, those who did retrieve data often found it unreliable and inconsistent. These types of problems arose because, in many cases, data were being retrieved from both a system that pulled the figures “live” and a system that pulled them from as long ago as the day prior. As a result, conflicting data sets emerged. People at the colleges talked openly about mistrusting the data that were available to them and the difficulty of obtaining data in a timely way. These problems were reported to have a negative effect on the ability of people to perform their jobs.

Many colleges and universities have established and developed offices of institutional research (IR) to facilitate staff, faculty, and administrative access to data and information, to assist in developing effective research inquiries, and to assist in analyzing the outcomes of such

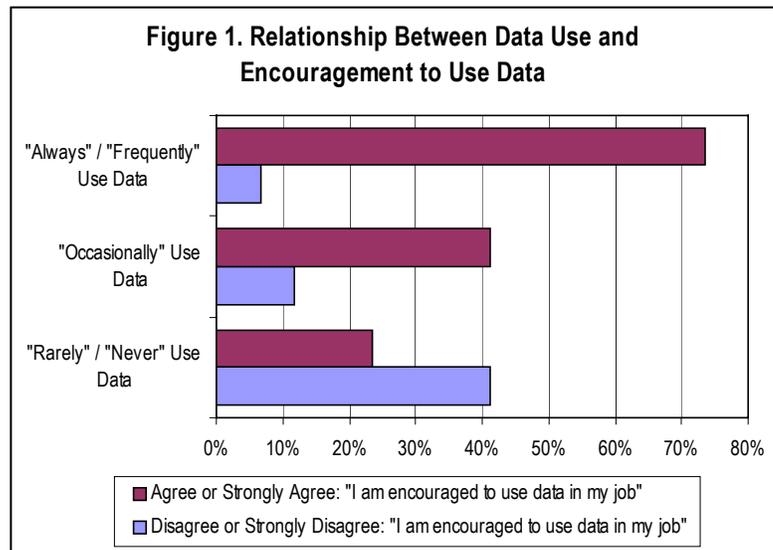
inquiries. Particularly when the information technology systems at a college are cumbersome and difficult to use, the IR office can play an important role in increasing access to data. In many cases, however, the IR function is itself overtaxed, has its plate full in meeting the needs of upper administrators and state reporting requirements, and has difficulty meeting the needs of faculty and staff. Unfortunately, this was largely the case in the community college district we studied.

We found that the inadequacy of effective technological and internal research systems created a significant gap between the employees' needs for data and their ability to access that data. This gap existed for faculty, staff, and administrators, but it was particularly significant for faculty and staff. Not surprisingly, the overall impact of having an insufficient technological system and an overtaxed research function is that, for many people, their basic needs for data and information were not met. According to our survey data, more than half of respondents (54 percent) agreed or strongly agreed that "it takes a great deal of effort to get the data" they need. We found that more than a quarter of faculty (28 percent) and more than one-fifth of administrators (21 percent) reported that it was "nearly impossible to get the basic data" they needed.

We also found that two-thirds of all respondents (66 percent) agreed or strongly agreed that "If I had more reliable data I could argue more effectively for necessary changes within the institution." Faculty were particularly convinced of this: 82 percent agreed or strongly agreed that they could argue more effectively for necessary changes if they had more reliable data, whereas 77 percent of administrators, and 49 percent of staff, were of this opinion. These, as well as other survey findings, suggest that faculty in particular perceived a need for better access to data. The findings also suggest that significant numbers of people at every level of the community college organizational structure believe that they do not have the data they need and that if they had such data, they could be more effective.

The Incentives and Disincentives for Data Use in the Campus Information Culture

Technological systems and the organizational processes associated with the internal research function do not exist in a vacuum. Rather, they are embedded within an organizational structure and culture that influence data use and information sharing in decision-making. Understanding and improving information use on campus requires looking beyond formal information systems and research offices to also emphasize the less formal organizational structures and values that create incentives and disincentives for data use.

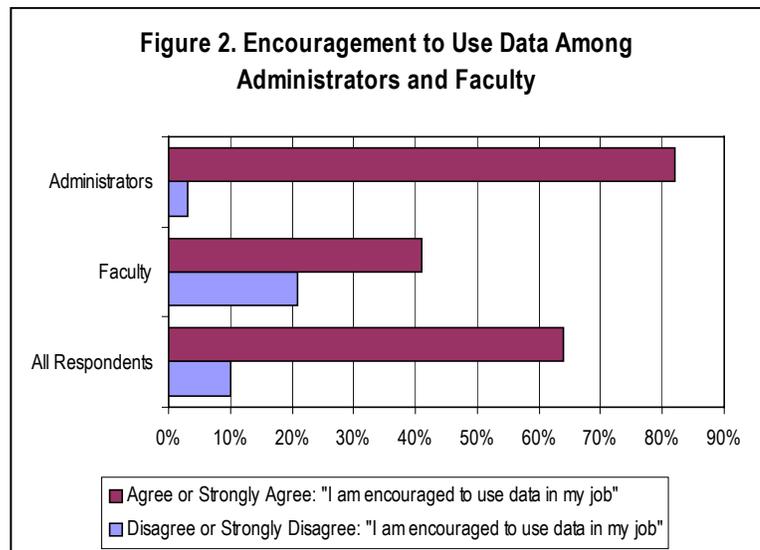


To test our hypothesis that data use is affected by organizational factors, we studied the relationship between data use and the encouragement to use data on the job. Nearly three-quarters of the respondents (74 percent) who reported that they used data “all the time” or “frequently” agreed or strongly agreed that “I am encouraged to use data in my job” (see Figure 1). On the other hand, only 41 percent of those who said they used data “occasionally” agreed or strongly agreed that “I am encouraged to use data in my job.” And, only 24 percent of those who said that they “rarely” or “never” used data agreed or strongly agreed that they were encouraged to use data. In short, we found that those who were encouraged to use data in their jobs were more likely to do so.

We also found a significant relationship between how often a person used data and whether or not the individual thought that using data for decision-making was considered a priority in the workplace. Sixty percent of respondents who reported using data “always” or “frequently” agreed or strongly agreed that “Using data for decision-making is considered a priority in my program/division.” On the other hand, only 13 percent of those who reported using data “rarely” or “never” agreed or strongly agreed with that statement.

These findings are significant in dispelling the notion that data use is solely dependent on such issues as hardware availability, an individual’s technical ability, or an individual’s attitudes about technology. Data use may be affected to some extent by these issues as well, but our findings suggest that it can be shaped by the individual’s environment. If this is the case, then data use can be encouraged through effective motivation and support in the workplace.

In exploring these issues in greater depth, we also found



differences in the way that administrators and faculty were supported with regard to data use for decision-making. For example, we found that 64 percent of all respondents agreed or strongly agreed that “I am encouraged to use data in my job,” while 10 percent disagreed or strongly disagreed with this statement (see Figure 2). However, whereas 82 percent of administrators agreed or strongly agreed with this statement, only 41 percent of faculty members did so. Conversely, 21 percent of faculty disagreed or strongly disagreed, while only 3 percent of administrators did so.

Likewise, we found that slightly less than half (44 percent) of the respondents agreed or strongly agreed that “I am required to use data by a supervisor, department chair, etc.” Almost one-third (29 percent) stated that they were not required to use data. Once again, we saw a relationship between a respondent’s position and how the individual answered this question. While 58 percent of administrators agreed or strongly agreed that they were “required to use data by a supervisor, department chair, etc.,” only 29 percent of faculty agreed or strongly agreed with this statement.

These differences between administrators and faculty members may reflect the fact that administrators have long been required to collect and analyze data as part of their work, while faculty involvement in demographic, fiscal, and other data outside the classroom may be a newer phenomenon stemming, at least in part, from increased calls for greater accountability in higher

education. However, whatever the causes of these differences, faculty are in fact being asked to become more involved in these kinds of issues, and it appears from our research in this district that many are quite willing to do so. At the same time, many are not being encouraged and supported in their use of data and information in decision-making.

Our research also found that perceptions about the way data had been used historically had a significant affect on an individual's willingness to collect, share, and use data in decision-making. For example, during the three years of our research, it was clear that the district we were studying was and had been actively engaged in continuous learning efforts geared toward the improvement of programs and services for students. Despite the cumbersome qualities of the information system, the administrators, faculty, and staff attempted to pay close attention to the changing demographics of the student body at the college campuses and were engaged in self-reflective efforts about how to improve programs and services. For instance, there was much research into and discussion of the effectiveness of student service interventions in improving persistence and completion. Many people—administrators, faculty and staff—sought to determine the effectiveness and cost of various interventions, including tutorial centers and academic counseling. Moreover, the institution had a strong reputation for offering an innovative and flexible curriculum in response to student needs. That is, despite the shortcomings of the information system, people had managed to create an active culture of internal research and inquiry, a culture that asked complex questions about student needs and that explored better ways to meet those needs.

Yet, in studying the response of the district to the Partnership for Excellence (PFE)—the state's performance-based funding initiative for the community colleges—we found that an evaluative environment was introduced on campus that reinforced non-cooperative information-sharing behaviors among individuals. Initially, district and college leadership sought to implement the PFE program as a positive incentive-based program. Campus leaders conducted a series of meetings with administrators, staff, and faculty to inform them about the goals of the PFE initiative and to set forth a plan for how the district would respond to the new state mandates. The district developed a proposal process through which campus programs could apply for the new funding. This process required programs to set measurable goals for student learning outcomes and to design evaluations to measure whether those outcomes had been

reached. The district also provided trainings to assist administrators, staff, and faculty in developing effective evaluation methods for their programs.

Many people publicly voiced support of efforts to set up evaluative frameworks for their PFE-funded programs. Over time, however, the research team observed that many of those who publicly voiced their commitment to improved outcomes also sought to buffer themselves from the possible consequences of the emerging internal evaluative environment. This ranged from engaging in rationalizing behaviors to deflect attention from their own program's possible substandard performance, to resisting attempts to improve the IR function on campus. Publicly criticizing the internal research function, while at the same time impeding efforts to improve it, served those who sought to prevent internal efforts to meet external accountability.

These efforts found allies in those whose own power was enhanced by maintaining limited access to data, and this may be where the lasting, yet unforeseen, damage of the PFE mandates lies for this community college district. There were those who resisted the creation of a new campus-wide integrated information system that could have improved access to data. In addition, during our research, the restructuring of the IR office was redefined and renegotiated by those who stood to directly or indirectly lose control of data and information that the new structure would impose.

The irony is that these types of self-serving behaviors are perhaps most common in a climate of external pressure for accountability. In fact, our findings suggest that self-serving behaviors may be a common individual reaction to perceived external threats to competence. For institutions to respond effectively to external mandates, more research needs to be conducted to understand the complex ways individuals react within such an evaluative climate. In this way, effective planning and management can help minimize the perceived need for such behaviors and thereby improve the use of data and information to reach positive change and improvement.

In summary, data use does appear to be affected by the individual's work environment. The use of data and information in decision-making may be significantly altered by whether or not managers, deans, senior faculty, coordinators, and vice presidents support processes for data gathering and analysis. Moreover, how data are used in an environment of accountability—such as using data to punish programs as opposed to exploring program improvements—can also affect the willingness of people to participate in data gathering and analysis. For those interested in promoting institutional improvement within colleges and universities, either from outside or

from within, it is important to explore and understand the organizational processes that can create incentives for effective data use.

Workarounds: A Possible Consequence of Inadequate Information Flow

One possible consequence of inadequate information flow on campus is that enterprising individuals devise methods to “work around” their lack of data support by creating or participating in idiosyncratic methods of data collection or management. These informal practices—called *workarounds*—include a wide range of low-tech solutions, such as hand-counting the number of student interventions on a given day each week to establish patterns of use, or reviewing a selected number of student transcripts by hand to determine the effectiveness of a program. Workarounds also include a wide range of more sophisticated technological efforts, such as designing local, non-official databases and information systems that can provide or disaggregate data in ways that the district-wide information systems cannot. This also includes exporting data from official campus-based systems into alternative software programs that allow for increased access or more robust analysis.

At the community college district we studied, we found that a high percentage of people relied on workarounds to access the data and information they needed. More than half (54 percent) of survey respondents said they participated in localized efforts for gathering or compiling data in ways that were consistent with workarounds. No particular group—administrators, faculty, or staff—relied on workarounds more than others.

Our study found three primary kinds of workarounds:

1. *Manual data collection*: Participants described processes—some simple and some elaborate—that they used to manually gather data, physically delving into day-to-day operations of programs and departments. Examples: gathering information about student demographics in a specific program, gathering information about student retention rates for a specific program, and collecting actual enrollment counts by class to check the data provided by the centralized information system.
2. *Manual data manipulation*: Participants described efforts to manipulate or re-key data that had already been gathered by the central information system so that they could use it for their own needs. Examples: re-keying names and addresses for mailings,

and downloading student names in a specific program and matching them with demographic characteristics and outcomes.

3. *Local database creation*: Participants described efforts to routinely create, maintain, and use local databases because they could not access the data and data manipulations in any other way. These databases, found throughout the institution, consisted of data that had been compiled during the course of several quarters or even years, though often in inconsistent ways. Examples: creating a database to track specific cohorts of students over time, creating a database to enable comparisons of fiscal data and student outcomes, and creating a database to examine persistence rates associated with curricular revisions.

We also found a fourth response to lack of data: Some people simply gave up and decided not to spend the time to gather or analyze data on their own. At this research site, however, the prevalence of workarounds revealed a college district whose faculty, staff, and administrators were engaged in a high level of inquiry about improving teaching and other student services.

Based on our research at this college district, the presence of workarounds within an organization may reflect an overall innovative research culture within the institution as well as offer a promising glimpse of where some of those key pockets of innovation and self-reflection exist. Those who have employed workarounds appear to be willing, at least for a limited time, to engage in such efforts *without* organizational support. For organizations interested in creating a culture of inquiry on campus, those employees who are already engaged in workarounds suggest a promising group of individuals to get on board. Furthermore, it is reasonable to suggest that those employees who have not created workarounds may indeed be willing to engage in self-reflection and organizational improvement through effective use of data and information—if given the organizational support to do so.

The existence of workarounds can also reveal where information technology gaps may exist on campus and where much of the energy for cultures of inquiry may lie within the organization. People employ workarounds because they have not been able to get the information they need from centralized systems. In higher education environments where internal and external pressures exist for organizational improvement, centralized information systems can never be as flexible as employees and programs require. That is, many temporary and local needs

cannot and should not be met by formal centralized information systems, primarily because it is more cost-effective and flexible to meet these kinds of needs at the program level rather than with a college-wide solution. Likewise, at the district level, there are also one-time needs for data that are best handled outside the existing information system. As a result, there will always be gaps between what a centralized system can provide and what at least some employees and programs would like to have. Workarounds will always, to some extent and for a limited time, be necessary within a vibrant, self-reflective organization. However, as was the case in the community college district we studied, workarounds can also serve to highlight where the gaps in information flow exist. As colleges and universities work toward improving their information systems, the existing clusters of workarounds could suggest promising areas of attention.

The Costs of Not Providing Access to Data and Information

Although there appear to be benefits associated with workarounds, there are significant costs to not providing access to the data and information that people need to perform their basic job functions. Although most of these costs are hidden and are not considered in overall cost assessments of investing in new systems of information technology, they are nonetheless very real and have a significant impact on the effectiveness of the institution in reaching its goals. Therefore, it is important for these hidden costs to be analyzed and considered alongside the costs of investing in a new technology system when such issues are on the table.

At the institution we studied, most employees who created workaround solutions to their insufficient data environment were very aware of the excessive amount of time and resources they expended to gather and analyze data. Those who manually collected data described elaborate procedures for counting students class by class and program by program. Many departments and programs expended additional staff time checking to make sure that manual insertions of data were accurate. Systematic, centralized data entry and checking generally leads to predictable and routine costs that are drawn from administrative budgets. Idiosyncratic data gathering, on the other hand, leads to unpredictable costs that can negatively impact academic and other budgets. Also, the manual gathering of data requires recurring costs of staff time, week after week, quarter after quarter.

We found that the creation and maintenance of local databases also represented significant hidden costs to the organization. For instance, we found that the existence and

prevalence of local databases served to further fragment the data environment at this community college by creating information silos. Rather than having common, formalized procedures to get information, individuals had to know who to go to in order to access the data they needed.

Secondly, we found many instances in which the databases outgrew the skill levels of their creators. In general, the individuals who created local databases were technically savvy in that they knew how to use a particular software program to create, maintain, and manipulate a database. However, because these databases often used software that was not supported by the institution, some participants reported being confronted by their own inability to use their software to its full capacity. We found that this problem was compounded when the originator of the database left the organization. In many cases, the college not only lost the database entirely, but also the findings or new understandings that may have resulted from it because the research was done informally and in a vacuum of sorts.

Centralized information systems cannot be expected to serve every need for data. In our research at this community college district, however, we found that the workarounds themselves had become calcified—that is, they had become so prevalent that they became a routine response to an inability to access data. For example, many program managers, fully aware of the extensive staff time required and of the unpredictability of results over time, nonetheless asked staff members to compile their own data. Because the managers had no other way to get the information they needed, they encouraged people to complete routine and repetitive tasks that information systems are designed to perform automatically. The calcification of workarounds represents time and resources wasted at the organizational level. It also represents a gold mine of lost opportunity. As program managers, deans, faculty, and others find repetitive, expensive, and partial solutions to their data needs, they stop pressing for system improvements that could meet their needs more efficiently and effectively. As educational institutions consider their technological and information infrastructures, these kinds of costs need to be examined and addressed.

An information environment that is dominated by workarounds incurs another kind of hidden cost: Many people respond to insufficient data support by giving up on using data and information to improve programs and services. In our study, we found many people who had turned away from using data to inform their programs and services. For these people, when

confronted by the time-consuming nature of maintaining workarounds, some simply chose not to gather or use data altogether.

This type of reaction to the information environment can be extremely damaging to the organization because it can prevent people from otherwise engaging in a research culture that can improve the organization as a whole. In addition, we found that the challenging data environment at this college district not only limited individual opportunities for exploring improvement, but also had negative repercussions on the ability of the district to respond flexibly to external demands and needs. In a tight fiscal environment, each college's ability to respond flexibly and to represent itself well to external audiences can be crucial in helping it fulfill its mission.

Perhaps the most troubling consequence is that students might not be fully served. Despite the fact that many administrators, faculty, and staff expressed interest in accessing more data for decision-making, they were not adequately able to explore whether students were placed with precision in the classes they needed to graduate, whether the curriculum was designed as specifically as it needed to be for the changing student body, and whether interventions adequately addressed student needs. Participants who sought greater access to and use of data wanted to know how they could best apply resources to leverage student success as well as how to put programs and policies in place to increase student success and to measure how well they were able to accomplish those goals. This revealed an organizational culture rich in internal research and inquiry, yet insufficient in organizational support for such inquiry. These comments also reveal the significant costs of lost opportunity—in terms of the challenges of improving student success—that are associated with inadequate organizational processes for developing and managing institutional knowledge.

Policy Implications

At this community college district, our research revealed an institution struggling with complex processes associated with the democratization of data. We found plenty of faculty, staff, and administrators who wanted better data and information to improve their decision-making. They were willing to ask probing questions, analyze their findings, share them with others, and then probe deeper with a new round of investigations and evaluations. At the same time, many of these faculty, staff, and administrators reacted to the state's performance-based PFE mandates by supporting the status quo because insufficient data support within the organization offered them

a buffer from a form of accountability they perceived as invasive and punitive. In the dynamics of information politics, this group found allies in those who preferred the status quo for their own reasons—in some cases because the status quo afforded them control of the means of access to data and information, or simply because they were more comfortable with incremental rather than dynamic change. As a result, the community college district opted against implementing a system-wide, integrated information system and selected instead to increase staffing of the internal research offices at the campus level. The net results of these decisions were to maintain historical control of information flow and channels while incrementally enhancing the ability of the internal research office to respond to internal queries. Our research suggests that, in an environment of external accountability, even those institutions that have historically maintained a culture of inquiry face significant challenges in implementing processes to increase the democratization of data on campus, and thereby to seek improved student outcomes.

Based on these findings, several important policy considerations at the campus and state levels could improve student outcomes by enhancing the use of data and information in decision-making.

Implications for Institutions of Higher Education

- **Make reliable data broadly available in a timely way to more faculty, staff, and administrators.** As advances in technology make the delivery of data and information more accessible to non-technical “users,” institutions of higher education have the opportunity to empower faculty, staff, and administrators throughout the institution to improve organizational processes and educational outcomes. One important way to advance real collaboration among faculty, staff, and administrators to improve student results is to charge groups of stakeholders with making data and information more broadly available to those who need that information for decision-making. The process of working across departments and functions to create common and user-friendly information systems can be a transformative one, as people who have not communicated extensively with each other must work together to understand and determine what kinds of data to gather and monitor and how to make such information accessible to a wide range of users.

- **Encourage data use by valuing inquiry through everyday organizational procedures.** Making data available is only the first part of the equation, and it is not sufficient for institutionalizing improvement. Organizations and leaders who create policies and processes that value the use of data in decision-making instill and support a culture of inquiry throughout the institution. For example, do deans and upper management ask for data support for budget requests? Are there institutional policies that support the sharing of data and information? Does upper management support efforts to investigate ways to improve student achievement, or does it seek to penalize programs that may not be meeting objectives? Are external demands for information met proactively, or in dismissive ways? Are faculty, staff, and administrators engaged in efforts to improve the accuracy of data? These are the kinds of issues that can encourage—or discourage—the creation and support of a culture of inquiry on campus. It is the use and sharing of data, not its mere availability, that is the litmus test for an effective democratization of data.
- **Identify those who are using data and information in decision-making, and encourage them to share what they know.** Most colleges and universities already have a select group of faculty, staff, and administrators who have gained a reputation for gathering and using information to improve teaching or other services to students. In some cases, these individuals are unofficial data keepers; they have created their own databases of information and are known to be sources of knowledge. For those institutions committed to improving student achievement, it is important not only to motivate these individuals to share what they know with others, but also to support and involve them in the process of institutionalizing their knowledge resources. In this way, existing workarounds can be identified and used to help plan improvements in information systems and flow, with the overall aim of understanding and improving student success.

Implications for State Policy

- **Support the democratization of data on campus.** During the past decades, state legislators have been active in pursuing greater accountability in higher education through performance-based budgeting and other means. Perhaps the most effective

way to achieve such aims, however, is to empower stakeholders on and off campus to have greater access to data and information regarding multiple measures of student achievement. To achieve this aim, colleges and universities need state financial support to create powerful information systems that can be accessed and used easily by faculty, staff, and administrators on campus who are not technically savvy. By providing the means for stakeholders to have pertinent information about student success, state leaders can strengthen those on campus who are seeking improvement of student outcomes.

- **Create opportunities for bottom-up involvement in the creation of state mandates for accountability.** It is important for the state and other external oversight bodies to provide opportunities for campuses to participate in the creation of performance-based incentives or other mandates. Because each campus often has its own groups or individuals working to improve student success and organizational effectiveness, it may be that the most effective performance-based measures serve to empower those already on campus who are working for change. Conversely, the least effective measures may be those that create a “circling around the wagon” attitude on campus, whereby even those who had been working for change perceive the state mandates as so threatening that they align with those who are seeking to maintain the status quo.

Conclusion

Given the technological capabilities now available for building powerful, user-friendly information systems, many colleges and universities that seek to understand and improve their rates of student success wrestle with opportunities to increase data availability and use on campus. The community college district that we studied grappled with these kinds of decisions during the duration of our research project and ultimately decided against replacing its legacy systems with an integrated campus-wide information system. Instead, the district—which had an active and a vibrant culture of inquiry—opted to maintain historical control of information flow and channels, while incrementally enhancing the ability of the internal research office to respond to internal queries.

During our study, we found that faculty, staff, and administrators did not have access to the kinds of information they needed for decision-making. In fact, we found that inadequate technological and internal research systems created a significant gap between the employees' needs for data and their ability to access that data. One consequence of inadequate information flow was that many people sought to "work around" the system. For example, they informally gathered, tracked, or stored information not available through more formal and centralized channels. We found that those who were engaged in these kinds of activities represented a promising group to get on board in institutionalizing structures of improvement and change. We also found that there were ongoing and significant, though largely hidden, costs associated with the informal data-gathering efforts. These costs can and should be considered alongside the costs of investing in a new information system when such issues are on the table.

Perhaps one of the most promising findings of our research is that data use can be affected considerably by organizational factors. For example, we found a significant relationship between how often a person used data and whether the person thought that doing so was a priority in their workplace. We also found a significant relationship between whether people used data in their jobs and whether they were encouraged to do so. These findings suggest that data use can be encouraged through effective motivation, support, and leadership in the workplace.

Making data available to and encouraging its use among broader numbers of people brings with it a host of opportunities and challenges for colleges and universities. Through the democratization of data, colleges and universities may be able to provide deans, program managers, administrators, faculty, counselors, and others with the information they need to better understand student success and seek program improvements. There are risks involved, since access to information about such issues as program budgets and student outcomes can provide people with a valuable and powerful tool of influence and thereby transform traditional hierarchies of decision-making. However, it may be that the democratization of data offers colleges and universities their best opportunity to maintain decision-making and accountability at the campus level rather than in the legislatures. Those institutions that provide their own faculty, staff, and administrators with the means and support for decision-making are in a better position to respond flexibly to external mandates while at the same time making better and more proactive decisions about improving student success and organizational effectiveness.

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