

Turning Student Data into Actionable Information

INSTITUTIONAL CONTEXT

At Colorado State University (CSU), more than one in every five students is low-income or of color, and one in four is the first member of their family to attend college. In recent years, CSU has doubled down on its efforts to support all students to degree completion by turning student data into actionable information to improve student success. While this focus began with strengthening and maintaining data quality, systems, and access, it has matured into a cultural shift resulting in strategic, sustainable, and scalable institutional improvement.

CSU believes that institutional data are assets which should be used proactively to inform campus conversations, policies, and initiatives. As such, data should not be “owned” by any one office on campus. Instead, data should be institutionally “owned” and accessible, accurate, and timely while individual offices serve as stewards to facilitate appropriate data use, interpretation, and understanding. Data, turned into actionable information, have propelled institutional change at CSU.

USING DATA TO IMPROVE STUDENT OUTCOMES

PROGRAM LEVEL. A 2012 analysis at CSU revealed that first-year students who were unsuccessful in foundational chemistry, life sciences, physics, and math courses—earning a grade of D or F, or withdrawing after the course had started—had a lower predicted probability of gradu-

ating (52 percent compared to 81 percent, demographics held constant). These data informed efforts to improve how these courses are taught, as well as the academic support provided to students who take them, which ultimately decreased both the percentage of students who were unsuccessful in the course and the number of students who experienced academic difficulty overall. As a result, for students in their first year at CSU, the General Chemistry unsuccessful completion rate dropped 4 percentage points; the rate for Calculus I for Physical Scientists dropped 8.9 percentage points; the rate for Physics I for Scientists & Engineers dropped 9.4 percentage points.

INSTITUTIONAL LEVEL. The most commonly used measure of student success is the six-year graduation rate. At CSU, increasing the number of students who graduate is viewed as a by-product of deep and meaningful student learning. To best facilitate that learning, it is critical to identify students who are at risk of not succeeding in their course work or at risk of stopping/dropping out so that they can provide them with appropriate support services. This requires an authentic assessment of their strengths and risk factors, as well as a coordinated approach to providing support. CSU recently complemented the identification of at-risk students with predictive analytics (provided by a national vendor) to help advisors intervene with students and prevent them from stopping or dropping out.

Another approach, an Early Performance Feedback (EPF) system, strives to increase the level of feedback on academic

performance for first-year students in large sections of strategically selected first-year courses during the critical first weeks of the semester. Instructors in the selected courses assign a progress indicator of “S” for “satisfactory” or “U” for “unsatisfactory” for each student in the course based on the student’s level of performance during the early weeks of the semester. Those ratings are then used to identify and intervene with students who may be encountering academic or other difficulties and connect them to relevant resources for support. CSU data from the last five years indicate a high level of accuracy in identifying students at risk of academic difficulty through the EPF process. There are multiple people who can reach out to students with EPF “U” indicators as well: the course instructor, the student’s academic advisor, or a member of the residence life staff. Each of these staff receive data, but at varying levels of specificity depending on their support role. Additionally, the university sponsors an academic coaching and resources fair called *U-Turn* for students who may be struggling in courses mid-way through the semester.

RESULTS

Since CSU began this work, their graduation rates have increased by 6 percent, more than in the 10 years prior. Identifying academic behaviors that increase the likelihood of persistence after the first year is critical to improving student success. CSU analysis of past student behavior indicates that completion of a foundational math course, a foundational composition course, and 30 credit hours in the first year increase the odds of degree completion. Furthermore, if a student achieves all three milestones, the odds of graduation increases by 76 percent over peers who achieved none. Bringing this evidence to orientation advisors has increased the share of each entering class completing 30 credits in their first year from 39 percent to 42 percent, increased the share of first-year students who successfully completed a foundational math course from 69 percent to 72 percent, and increased the share completing a foundational composition course from 90 percent to 91 percent. Simultaneously, CSU has seen the percentage of first-year students who return for their second year increase from 85 percent to 87 percent, which they expect to see mirrored in the six-year graduation rate for these students. At the departmental level, literature related to the science of learning indicated that an early low-stakes examination could help identify students at risk of course failure. The

Psychology Department implemented such an exam and saw improved student performance on the first major examination.

LESSONS LEARNED

While making progress in the use of student data, CSU has identified the following lessons and challenges.

- ▶ **Ensure data quality, accuracy, and security through automated and manual checks by multiple offices.** This is especially critical when systems, staff, or variables are new. While an Institutional Review Board can resolve research data issues, there is little prescription for handling data used in assessment and quality improvement of the educational experience. Automated edit checks and consistent communication are imperative.
- ▶ **Establish a strong and intricate curricular and co-curricular collaboration between data collection entities such as the University Registrar’s Office, Information Technology, Advising, and Institutional Research.** Campuses have access to more data and different kinds of data than in the past, which can be useful for improving student services, but which may go beyond the traditional student record: library/cafeteria/gym card swipe entries, course and program assessments, and in-course behavioral data (such as how engaged students are in class discussions via their online course management systems), etc. How these data are managed, retained, and used is new territory that needs to be explored carefully.
- ▶ **Establish, if there is not one already, a Data Governance Committee with oversight of data collection, data architecture and storage, and ethical use.** Membership on the committee should include information technology and data authorities from each of the major functional areas on campus, as well as representatives from units and groups using such data to improve students’ educational experiences (e.g., academic advising, student affairs, and academic support programs; curriculum and undergraduate affairs committees; assessment and professional development offices). Institutional legal counsel should be involved as necessary regarding privacy and confidentiality issues.

► **Be fully transparent with students, faculty, and staff about what types of data are collected, where/how it is stored, and the importance of data privacy and security.** A recent survey from Ellucian¹ confirms previous research demonstrating that students want their college/university to use their personal information to help keep them on track to graduation and support their academic success, it is still important to be fully transparent about the types of data that are collected and how they are used. Explanation(s) related to this level of transparency could be relatively easily integrated into already existing mandatory annual

Family Educational Rights and Privacy Act (FERPA) notifications to students.

► **Use analytics responsibly in efforts related to the success of individual students, various subpopulations, and the institution's broader mission.** Responsible use includes carefully crafted messaging and thorough training related to application and analysis of data and the interpretation of results. When possible, data should be shared in aggregate form, rather than at the student level, to minimize the sharing of files that contain personally identifiable information.

1 Meyer, L. (2016, October) "Survey: Students Think Schools Should Use Personal Data to Improve College Experience." Retrieved from <https://campustechnology.com/articles/2016/10/31/survey-students-think-schools-should-use-personal-data-to-improve-college-experience.aspx>

