

Foreword

The EDUCAUSE Center for Applied Research (ECAR) was launched on January 1, 2002, to create a body of research and analysis on important issues at the intersection of higher education and information technology. ECAR is fulfilling its mission through a program of symposia and through the publication of (1) biweekly research bulletins oriented to senior campus functional executives; (2) detailed studies designed to identify trends, directions, and practices in an analytically robust fashion; (3) case studies that showcase campus activities and highlight effective practices, lessons learned, and other insights from the practical experience of campus leaders; and (4) roadmaps and key findings, which present the highlights of detailed ECAR studies for a broader audience. Since ECAR's inception, eight symposia have been held and more than 200 research publications have been issued.

Academic Analytics in Higher Education: The Untamed Frontier

In 2002, ECAR published *The Promise and Performance of Enterprise Systems for Higher Education*, our comprehensive review of the state of adoption and experience with enterprise systems generally and commercially

vended ERP systems particularly. What we learned was that higher education had spent an estimated \$5 billion on the modernization of enterprise administrative systems (finance, HR, student) in the closing decade of the last century. We succeeded, to a great extent (and with notable exceptions), in implementing these large and complex systems on time and on budget (Kvavik & Katz, 2002, p. 11). Our research on enterprise systems also revealed that "ERP products often cannot generate the reports the institutions need. Many institutions have created data warehouses to solve their reporting and data query needs." (Kvavik & Katz, 2002, p. 15)

This finding was important because it is also clear that many institutions invested in new enterprise systems believing that these major investments would not only enhance the processing of student, financial, and HR transactions but would also vastly improve the quality and timeliness of information in these areas and render information in forms that would facilitate decision making. This disconnect between expectations and actualities colored much of the journalistic reporting on the ERP phenomenon of the 1990s. The message of much of this reporting: higher education has spent much to win a battle, but not yet a war.

What's in a Name?

For researchers, such findings are important and even magical because they bespeak an incomplete story. Indeed, we asked, what then is the state of the practice of reporting, analysis, decision support, and the complex of technologies and techniques that compose what many call *business intelligence*? Before proceeding, we felt the need to consider new terminology. The term business intelligence was coined in the private sector, for the private sector, and it rang hollow to our delicately trained academic ears. Our scope of interest was of course more than business, and, frankly, the idea of intelligence—competitive or otherwise—just felt wrong in the context of the academy (unless, of course, we were referring to the wisdom of our workforce!). A conversation with our colleague Karen Gage of WebCT surfaced new terminology that that firm was considering to describe the same complex of technologies and techniques. WebCT used the term *academic analytics* and graciously encouraged ECAR to use this language to describe the results of our work. Academic analytics, too, is an imperfect umbrella for these activities but, we concluded, a more fitting one for discussion within the academy.

We apologize for any perceived shortcomings in this language, but we know that you understand what we're talking about!

Deepening Study

Having resolved our nomenclature, ECAR set along two paths to create a picture of how higher education was using data warehouses, marts, data extraction, modeling simulation, scorecards, and a variety of other reporting and analysis tools and techniques. In the ECAR study *Good Enough! IT Investment and Business Process Performance in Higher Education*, we found that in general, respondents were more satisfied with transaction processing than they were with monitoring processes.

Respondents were even less satisfied with management activities (Kvavik, Goldstein & Voloudakis, 2005). Nearly half of all respondents in 2005 described their reporting and analysis processes as “adequate,” and—depending on the process being assessed—as many as one-third characterized these processes as being “at risk.” Notwithstanding an easy conclusion that much remains to be done in this area, it was heartening to find that 9 percent of respondents described themselves as “leaders” or “exemplars” as regards the reporting and analysis of enrollment management information. Selective progress has been made along this frontier (Kvavik et al., 2005).

Burrowing deeper still, ECAR moved in late 2004 to undertake a study dedicated expressly to the topic of academic analytics. The report that follows represents the culmination of nine months of research that included a literature review, a quantitative survey of 380 EDUCAUSE member institutions in the United States and Canada, interviews with 25 higher education IT leaders and 2 corporate leaders, and 2 on-site case studies.

Important Findings

The ECAR study *Academic Analytics: The Uses of Management Information and Technology in Higher Education* reinforces earlier findings that most academic institutions rely on their core enterprise transaction processing systems to meet their needs for information and analysis. Most of us are using academic analytics to support transactional and operational reporting and not for what-if analysis, predictive modeling, or alerts. Not surprisingly, areas that incorporate many of the advanced features of academic analytics are those that influence revenue, such as enrollment management and student services. Most of us plan to expand our capabilities in these areas in the next two years.

Importantly, the current ECAR study confirms again that leadership commitment and training are closely associated with institutional investment in these technologies and practices and with respondents' perceptions about a host of positive outcomes. Specifically, a robust academic analytics environment is often associated with leaders who are committed to evidence-based decision making and to ensuring the existence of a well trained cadre of analysts to work with information.

What's in Store?

Academic Analytics: The Uses of Management Information and Technology in Higher Education reveals that higher education's need for access to information is large and growing. The secondary literature in particular describes an environment shaped by (1) rising threats to revenue and downward pressure on costs; (2) increased competition and increasing consumer power and choice; and (3) greater pressure on colleges and universities to demonstrate outcomes. This environment has real implications for those responsible for organizing the academic analytics infrastructure for the institution.

- ◆ In tight budgetary climates especially, the institution with the best information and decision-making capacity can win.
- ◆ The velocity of decision making will increase as a premium is placed on nimbleness.
- ◆ Institutions will need to track, manage, and analyze more data about prospective students and markets, and more institutional information will be expected to be available in the public domain.
- ◆ Net generation students, staff, and faculty will have heightened expectations for data access.

This context and these implications suggest what might be characterized as a "burning platform" in this arena. What may be good enough in today's competitive context may, in fact, be inadequate tomorrow. The secondary

literature in this area suggests an evolution in practice (and theory) from

- ◆ producing canned and ad hoc reports from transaction processing systems, to
- ◆ reporting from data marts and warehouses, to
- ◆ using sophisticated analytic tools and techniques to analyze data and develop predictive models and assessment frameworks, to
- ◆ publishing data from transaction systems to predictive models in order to trigger an alert for some institutions, to
- ◆ creating an integrated and autonomic environment in which information is dynamically shared between transaction processing systems and decision engines that in many cases resolve identified issues according to the institution's rules and notifies process owners after the fact.

Higher education—and most other sectors of the economy—are only partially through this journey, and, with each level of progress, new issues of policy and practice are likely to be raised. Are we creating a seamless environment in which decisions are driven from data? Are our models good enough? How do we balance the benefits of profiling things like academic performance, persistence, retention, and so forth with an individual's rights to privacy? These are not new issues. Academic advisors, for example, have balanced such issues for decades, but they can and do assume a different guise under the banner of new technology, new techniques, and new processes. As British columnist Jeremy Clarkson observed—in the wake of machine-generated autonomic glitches in his credit reporting—"this was Skynet and I was John Connor" (Clarkson, 2005).

Many People to Thank

This ECAR study is designed to provide a first fact-based and national perspective of higher education's academic analytics envi-

ronment that can lead to the improvement of practice for higher education in this important arena. The report furthers the baseline for higher education that begins with the ECAR study of ERP in 2002. It identifies which academic analytics policies, products, and procedures are currently in place. Institutions will be able to compare their investments and practices to those of similar institutions. Emphasis is placed on both the benefits and costs of implementing academic analytics solutions, with a discussion of trade-offs and future trends.

ECAR research studies are the result of a team effort. Philip J. Goldstein was the principal investigator on this research effort and is the primary author of this study. I had the privilege of serving as his sounding board and of speculating in Chapter 9 about the future of the practice in this arena. Phil's research design was developed with a team that included Harvey Blustain, Judy Caruso, Bruce Metz, Judith Pirani, Gail Salaway, John Voloudakis, and me. Two members of this team, Gail Salaway and John Voloudakis, also provided necessary advice and guidance on the survey that was developed in support of this research. Toby Sitko coordinated the production of this study with the team composed of the terrific staff of EDUCAUSE and our external suppliers, whom we really think of as friends and colleagues

Of course, the real team in any ECAR study is the EDUCAUSE community. Our ability to develop a good understanding of practices, policies, and directions in higher education depends on the goodwill of our associates in the community. Literally hundreds of busy IT leaders shared their experiences and expertise on our quantitative survey, and dozens more gave generously of their time in interviews. Vice Chancellor of the University of Alabama Priscilla Hancock; CFO, CIO, and Dean of Libraries at Baylor University Reagan Ramsower; and Vice President of the University of Texas

at Austin Daniel Updegrave were particularly helpful in shaping our understanding of this issue. In addition, ECAR fellows enjoyed the widespread support of senior executives and others at the University of Phoenix and the University of California, San Diego, pursuant to our publication of two separate, but complementary, case studies. Robert Kvavik, Associate Vice President of the University of Minnesota and Senior ECAR Fellow, always brings insight to the table and leavens every discussion with wit and wisdom from a career in the service of higher education. Among our corporate friends, Julie Curtis of SunGard Higher Education, Karen Gage of WebCT, and Karen Willett of Oracle were generous with their time and offered perspectives that spanned large customer bases.

Finally, ECAR, while now enjoying the support of more than 360 college and university subscribers, continues to depend on the generous support of a small and dedicated cadre of corporate sponsors. Datatel, HP, Oracle, SunGard Collegis, and SunGard SCT not only provide financial support of ECAR but are also generous with their advice and skilled resources.

This study of academic analytics reminds us that that the opportunities and challenges posed by networked information demand responses that are at once technological and cultural in nature. The story of academic analytics in higher education is ultimately a story of people—technologists, transaction processors, analysts, and decision makers. We learn again that leadership and culture matter deeply in the choices that institutions make about information technologies and the speed with which those choices are adopted. In the case of academic analytics, there may be a vision gap, as these technologies, which are largely mature, have the potential to positively and directly impact core drivers of institutional success, such as student achievement, academic persistence, retention, and admissions

selectivity. Dozens of institutions possess this vision and are already quietly demonstrating important outcomes. As course management systems attain the status and stature of enterprise systems, they too will acquire and store volumes of student data that, when combined with other information, can begin to help us more fully understand the student experience around learning.

Academic analytics in higher education remains in its infancy, or perhaps in early childhood. The potential, however, is great,

and it is likely that the times will demand more of our data and the systems that manage it. Leadership remains the key. Quite clearly the IT community understands the tools and techniques of academic analytics but rightly awaits a cadre of process leaders who will insist on information that is more accurate, timely, and nuanced and who will provide both the resources and political cover to realize the potential. Knowledge is indeed power, and power, in the end, is embedded in cultures and vested in leaders.

*Richard N. Katz
Boulder, Colorado*