Title of Proposal
Leveraging learning analytics for teaching and advising: Barriers and behaviors related to adoption by faculty and staff

Abstract
An NSF-funded case study was conducted at a large research university to understand how faculty and advisors use learning analytics data to inform teaching pedagogy, course design and advising practices. Preliminary results indicate users appreciate these systems, but are often slow to adopt and leverage them to their maximum potential.

Format
First Choice: F01- Research Paper
Second Choice: F02- Roundtable
Third Choice: F00-

Content
Study Objectives/Purpose
The purpose of this study is to better understand how faculty and advising staff use learning analytics, data connected to learning and advising management systems, to inform their teaching pedagogy, course design and advising practices. Higher education institutions are facing increasing pressure to provide "proof" of learning; teaching pedagogical best practices are moving to an increasingly individualized and student-focused learning model; and innovative technologies allow for greater mining of student data (Austin & Sorcinelli, 2013; Austin, 2003; Amey, 1999). Among the technologies introduced to academia in the last decade have been learning and advising management systems. Many faculty and staff use these systems, Blackboard and Moodle being among the most popular learning management systems and EAB Student Success Collaborative being among the most popular of the advising management systems (Dahlstrom, Brooks & Bischel, 2014). These traditional systems have provided basic analytics that focus on data related to student page views or activity interactions and require faculty to use those analytics to reconsider pedagogy, course design and student interaction (Ali, et al, 2012).

What has been missing in these traditional systems is "comprehensive and informative feedback...of semantically interlinked data about all the elements of the learning process," including content, activities, outcomes and student data (Ali et al, 2012; p. 470; Jovanovic et al, 2007). In the past few years, the capacity to mine and store educational data and at ever-increasing levels has allowed for the development of more dynamic learning and advising management systems (Peña-Ayala, 2014; Ali, 2012). In this evolving environment, learning analytics has moved to the fore as a useful tool for the "measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of optimizing and understanding learning and the environments in which it occurs" (Ali et al, 2012; LAKI, 2011).

Learning analytics has the potential to generate new insight into courses and student learning by creating responsive feedback mechanisms that can shape data-informed decision making as it relates to teaching, learning and advising (Ali, 2012; Baker & Yacef, 2009; Ben-Naim, Bain & Marcus, 2009; Mazza & Dimitrova, 2007). Despite the benefits of using learning analytics-informed learning and advising management systems, there are barriers and challenges related to broad adoption and use of innovations like these systems (e.g., lack of interest, knowledge, time, training, resources, incentives, institutional commitment, etc.) (Tagg, 2012; Brownell & Tanner, 2012; Fairweather, 2008; Austin, 2003; Fairweather, 2002). Instead of using these systems as to refine teaching, learning and advising practices, these systems instead are used often to merely track grades and other student-related data, like student page views and advising directives (Ali et al,
Thus, perceived usefulness and adoption levels of these systems range by the individual, which limits the tool’s potential.

While there is not a complete picture of why broad and high-level adoption of these platforms is often limited, the literature on organizational and individual change offers pertinent clues. Change in higher education is not only challenging and slow, but also often impossible given the complex and siloed nature of the academy (Kezar & Lester, 2009; Eckels & Kezar, 2003; Kezar & Eckels, 2002; Kezar, 2001; Berquist, 1992; Birnbaum & Edelson, 1989). Whether hampered by organizational structure, competing demands, lack of rewards or incentives, or a shift in professional identity, faculty and advising staff rarely deviate from the ways in which they were acculturated into their various disciplines (D’Avanzo, 2013; Austin & Soricinelli, 2013; Brownell & Tanner, 2012; Austin, 2011; Austin, 2003; Sunal et al, 2001; Amey, 1999). Further, individual behavioral change, even when incentivized, can be difficult to sustain, as change is often perceived as a threat or an opportunity for loss versus gain (Brownell & Tanner, 2012; Tagg, 2012; Heimlich & Ardo in, 2008; Locke, 1995).

As a part of a National Science Foundation grant focused on the development and analysis of a learning analytics-based learning management system, a qualitative study was implemented to learn more about the benefits, challenges, barriers and incentives associated with use of learning analytics by faculty and advising staff. Understanding how these systems are adopted and whether they meet faculty and advisor needs, provides a clearer picture of both the impact of learning analytics on student interactions, course design and teaching pedagogy, as well as how individual faculty and advising staff use these systems. Given the need to understand the relationship of big data systems as they relate to these aspects of academia, the following research questions were asked: 1) How are learning and advising management systems used by faculty and staff? 2) What are the benefits, challenges, barriers and incentives (if any) to the use of learning and advising management systems?; and 3) How do institutional incentivize faculty and staff to use these systems to their maximum potential?

Theoretical/Conceptual Framework

Key to this study is the understanding of how faculty and advising staff use learning and advising management systems and associated analytics. Specifically, the focus of this study is on the structural and behavioral barriers and incentives related to adoption and use of these systems. While the literature is vast on the identity and subsequent behavior of faculty related to teaching pedagogy and course design (Austin & Soricinelli, 2013; D’Avanzo, 2013; Tagg, 2012; Brownell & Tanner, 2012; Austin, 2011; Fairweather, 2008; Austin, 2003; Fairweather, 2002; Amey, 1999; Locke, 1995), there are few studies related to advising staff. However, given that advising has long been recognized as a form of teaching (Appleby, 2008; Hagen, 2008; Crookston, 1994), the work on faculty behavior and pedagogical change is extrapolated to the work of advising staff and is further supported by general behavioral change literature (Tagg; 2012; Heimlich & Ardo in, 2008; Locke, 1995).

The conceptual framework for this study is a combination of Austin’s (2011) systems model to understanding faculty members’ teaching-related decisions (Fig. 1). Austin (2011) uses a systems approach to explain teaching-related decision-making, highlighting the levels, levers and factors of faculty behavioral change related to those decisions. The external environment, institution and colleges or departments comprise the “levels of the system that influence faculty work in implicit and explicit ways” (p. 3). Their work is further impacted by “key levers” which influence faculty work including:

“…evaluation and reward systems, workload allocation, professional development opportunities, and the strategic use of leadership practices.” (Austin, 2011, p. 3)

Finally, the work that faculty do and the choices they make in that work are also affected by factors that stem from their personal “values, backgrounds, abilities and aspirations to their teaching” (Austin, 2011, p. 4).

Austin’s model is combined with the literature related to learning analytics, in particular the mixed-methods study by Ali and colleagues (2012), and provides a more comprehensive foundational model for this study. Ali et al (2012) offer insight into the incentives for faculty integration of learning analytics technology into their teaching. They designed a learning analytics feedback tool related to teaching and learning, and asked about levels of perception related to the “value of the tool” and the extent that “user interface” impacted perceptions related to that value (Ali et al, 2012, p. 473). They found that the tool’s feedback and data visualization was valued by faculty and identified potential areas for change or improvement in their pedagogy (Ali, et al, 2012). Further,
feedback related to student interactions was useful in explicating how “students acquire knowledge online,” as a means for improving online interactions (Ali et al., 2012, p. 477). The contribution of this study to the framework is the insight it gives into the factors associated with adoption of learning analytics tools. Specifically, faculty found that the tool was useful, as long as feedback was straightforward and relevant and the interface or dashboard, and easy to use.

It is important to note that a more robust literature review related to the framework and research questions will be provided in the final paper. Given the constraints of the proposal format, the framework and associated literature have been abbreviated in this brief.

Study Methods/Modes of Inquiry

A qualitative, instrumental case study design was conducted during the spring of 2015 at a large, public, research university in the mid-Atlantic region of the United States. Potential participants were identified via their use of the university’s online learning management system (Blackboard) and advising management system (EAB’s Student Success Collaborative). After IRB approval, convenience sampling was used to solicit participants, via email and in-person invitations. Also invited were advising network and faculty senate members. Additional participants were identified through snowball sampling. In all, more than 50 participants took part in this case study. An effort was made to find a diverse group of participants, with varying years of experience, disciplinary representation and active or passive use of management systems. Each of the participants self-selected into categories of high-, mid-, and low-level adopters of the systems they use for teaching and advising.

Data was collected via focus groups with multiple groups of 8-10 participants. Focus groups were divided by faculty and by advising staff participants, so that researchers could focus on the particular incentives, barriers and behaviors related to use of either the learning management or advising management systems on campus, but groups consisted of mixed usage-levels. Additional interviews and observations were conducted with 15 participants, allowing researchers to see, first-hand, how a faculty or advising staff member uses the system(s) to inform their approaches to teaching, courses and advising. Participants walked researchers through a typical session on the systems, talking about how they use the system’s components, what worked, what could be improved, what would ideally be a part of the systems they use for teaching and advising and would encourage increased use of these systems. Focus group, interview and observation notes and recordings were transcribed.

Data collection was completed in spring 2015, with data analysis occurring in late spring 2015. Consistent with methodological norms of qualitative inquiry (Mertens, 2005; Strauss & Corbin, 1990), the systematic coding of texts (i.e., interview transcripts and observation notes) serves as the primary means of data analysis. Codes were developed from the literature and transcripts using a constant comparative method. From those codes, themes were derived as noted below. Triangulation was employed by review of the data by research team members. Validation is ensured by offering participants review of notes and transcripts related to their focus group, interview or observation.

Preliminary Results

Preliminary results indicate that adoption and use of learning and advising management systems provides useful information and previously unknown insights that have the potential to improve teaching, course design and advising practices. Participants engaged in these systems in a variety of ways which were categorized as strong, mid-, and low-adopters. Strong adopters noted that they are able to easily see trends in the data over the course of a semester or academic year that use of these systems helps them refine their approaches to teaching, course design and advising. Despite the perceived benefits of use of these systems by strong adopters, faculty and advising staff at the mid- and low-adopter were less likely to leverage the full potential of their learning and advising management systems.

Not surprisingly, it appears that use of these systems is often dependent upon level of general computer literacy and level of literacy related to each of the management systems. Further, newer faculty and advisors are often more eager and adept at using these systems. While these results are not surprising, what is surprising is the lack of formal training individuals go through specific to these systems, especially for faculty. There appears to be significant cultural pull related to discipline that is at play in the adoption of these systems. Overall, advising staff seem to be more open to use of new systems, as long as they provide needed, useful and easy-to-use information. Systems that require too many log-ins or multiple screens are viewed as onerous, but still useful.
Given that advisors are often required or strongly encouraged to use these systems through their professional chains of command, it follows that they would see value in use of these tools. The picture is decidedly different for faculty, who are neither incentivized nor formally trained to use these systems and whose work is often focused on research, first, and teaching, second (Tagg, 2012; Brownell & Tanner, 2012; Fairweather, 2008; Austin, 2003; Fairweather, 2002). Lack of compelling institutional rewards and incentives, training and education related to learning management systems makes their adoption by faculty less of a priority.

Thus, high levels of adoption for these systems look to be strongly associated with varying organizational and disciplinary cultures; personal efficacy related to computer and technology use; and perceived benefits of systems use. The expected barriers to adoption and associated barriers to behavioral change were noted by both faculty and advising staff.

Study Significance

Higher education is increasingly moving toward data-informed decision making, driven by both internal needs and external pressures. The data garnered through learning and advising management systems, and associated learning analytics, have the potential to provide greater insight and informed decision making related to advising, teaching and courses. Understanding how faculty and staff can use data related to their students and their practices can grid this decision-making and can provide better support to students, enhanced teaching pedagogy and stronger course design. Yet, despite the benefits, it is also important to understand the barriers and explore ways to better incentivize a broader and deeper incorporation of these technologies into faculty and advising staff practice, as human nature, disciplinary difference, and the complex and competing demands of academia act as strong pulls away from comprehensive adoption. This study serves to add a deeper understanding related to issues of learning analytics use by faculty and staff. The findings of this research will add to the theoretical concepts and literature related to faculty behavior change and will provide new insights into the actions and choices of advising staff.

 attached file

ASHE-NSF Fig.1.pdf

Reference(s)


Brownell, S. E., & Tanner, K. D. (2012). Barriers to faculty pedagogical change: lack of training, time, incentives, and… tensions with professional identity?. CBE-Life Sciences Education, 11(4),


