Getting Ready & Getting Started: Academic Librarian Involvement in Institutional Learning Analytics Initiatives

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Librarians have invested in the assessment of student learning for many years. In the early years, librarians used surveys to gauge students' satisfaction, confidence, and self-efficacy at the close of library instruction sessions. More than a decade ago, librarians invested heavily in a variety of information literacy tests—some were local and homegrown, some were national and vendor-supplied. In the last ten years, many librarians have embraced the use of rubrics to assess artifacts of students' information literacy learning. And over the last five years, library studies correlating student library interactions with student learning surrogates have proliferated. Now, as their institutions of higher education commit to learning analytics initiatives, it is time for librarians to prepare for and engage with institutional learning analytics tools, systems, and strategies.

In many ways, the trajectory from librarian investment in learning assessment to involvement in learning analytics is a natural one. Learning assessment and learning analytics share a number of common values that librarians espouse. Both approaches demonstrate the importance librarians place on students' opinions, positive affect, confidence, self-efficacy, attainment of learning outcomes, commitment to growth and improvement, and ultimate success—whether that success is represented by retention in a program, minimized time to degree, GPA or similar achievement measures, speedy and appropriate employment, lifelong learning, or some other long range goal. Given these shared values, librarians will likely find learning analytics an intriguing and worthwhile next step of engagement in the development and assessment of student learning.

What is learning analytics?

Learning analytics has been explained in a number of ways, but perhaps the clearest definition is this: "learning analytics is the measurement, collection, analysis, and reporting of data about learners and their contexts, for the purposes of understanding and optimizing learning and the environments in which it occurs" (Conole, Gasevic, Long, & Siemens, 2011, para. 3). Essentially, learning analytics employ data to improve learning contexts and help learners succeed.

To achieve that goal, learning analytics systems input data from a variety of sources and output descriptive information about student populations and cohorts which is used to discover behaviors, characteristics, or other attributes that appear to lead to student difficulties or successes. Many learning analytics systems attempt to predict, based on known attributes, which students are "at risk" so that educators can intervene quickly. Interventions emanating from learning analytics systems include notifications to students, advisors, or faculty; requirements for students to meet with support services, changes to institutional processes or policies; or other actions intended to support improved student outcomes (ECAR-ANALYTICS Working Group, 2015).

Within the larger sphere of learning analytics, there are several levels. The most basic level of learning analytics describes what is happening in the learning environment and what learners are doing. This level is aptly termed "descriptive." The next level, called "diagnostic," refers to learning analytics that determine what is facilitating or hindering student success; the goal of this level of learning analytics is to diagnose obstacles and facilitators of student success. The third level, "predictive," refers to the use of data to predict likely student success or failure. This predictive level is the focus of current development in higher education learning analytics and has been defined as, "the ability to accurately predict future outcomes using learning data…[which] empowers stakeholders in the learning process (e.g., students, faculty, administrators, et al.) with intelligence on which they can act as means to achieve more desirable final outcomes" (ECAR-ANALYTICS Working Group, 2015, 2). The most advanced level—the "prescriptive" level of learning analytics—is not yet a reality, but it is conceptualized as the use of predictive analytics to suggest specific interventions and actions known to aid learners (Phillips, 2015).

Learning analytics systems come in a variety of forms and draw from a wide range of data sources. Many are "home grown" by individual higher education institutions, and even more are offered by vendors either as single offerings or suites of learning analytics "solutions." The learning analytics landscape is growing and fast changing; it's difficult to obtain a census of all the options. In general, learning analytics tools tend to be clustered into or across the following system categories: enrollment management, relationship management, business intelligence/reporting, learning management system activity/achievement monitoring, integrated planning and advising, early-alert warning, and degree mapping. Typically, the data used by learning analytics systems comes from student information systems, learning management systems, clickers, publishers, video-streaming and web-conference tools, surveys, and co-curricular and extracurricular involvement systems (ECAR-ANALYTICS Working Group, 2015). At this time, library data is generally not included in learning analytics systems.

What are the goals of learning analytics initiatives?

Learning analytics initiatives seek to increase student success and improve institutional business models. Institutional leaders are cognizant of the national dialogue about higher education value (or the lack thereof). They are mindful of stakeholder expectations that students will be retained from one academic period to another; complete courses, programs and degrees in a timely fashion; achieve learning outcomes; and graduate ready to gain appropriate employment and contribute to their communities. They are aware that their institutions are increasingly asked to demonstrate that they are delivering valuable learning experiences for students, assessing those learning experiences effectively, and intervening to assist struggling students when necessary. Institutional leaders know they are expected to be responsible stewards of the tuition dollars they accept, and that they need to reduce the costs of education while maintaining high standards (ECAR-ANALYTICS Working Group, 2015). To achieve these goals, they need to streamline business processes, demonstrate accountability, make data-driven financial decisions (EDUCAUSE, 2011), increase organizational productivity,

and respond rapidly to challenges (Long & Siemens, 2011). Learning analytics initiatives are intended to address and support the achievement of all these goals.

What are the challenges confronting learning analytics initiatives?

Most librarians list data privacy and security as top challenges confronting any systematic use of student data in higher education, and certainly, the importance of protecting student privacy and maintaining secure institutional data warehouses cannot be overstated. Institutions seeking to move forward with learning analytics efforts can address privacy and security concerns through rigorous data policies and processes, including the de-identification of student data prior to analysis and the replacement of personally identifiable information with unique identifiers and encrypted "master keys" (ECAR-ANALYTICS Working Group, 2015, 15). Interestingly, librarian concerns about these areas notwithstanding, data privacy and security are not typically the most difficult obstacles that learning analytics projects need to surmount.

Other, more difficult challenges stand in the way of learning analytics efforts. Perhaps greatest among them are issues of organizational culture and preparation. Higher education institutions frequently strive to be data-driven, but often the expectation that decisions will be based on evidence outstrips the reality. In order to be successful, institutions launching learning analytics systems need to develop a culture that prioritizes data-driven decision making and possesses the appropriate policies, procedures, and skills to underpin data-centric action-taking (ECAR-ANALYTICS Working Group, 2015).

Additional learning analytics challenges evolve from the data itself. Data quality is central to the value of any learning analytics effort, and the attributes of student data that could be problematic are many (Pipino, 2015). Furthermore, many data quality issues can be exacerbated when institutions study small student cohorts, a likely occurrence as institutions attempt to pinpoint groups of students requiring assistance. In addition, the predictive models that form the basis of most vendor-supplied learning analytics products are proprietary and closed. This leads to the inability of institutions to explain, tailor, or correct the results of student analysis or classifications. Misunderstandings may occur if stakeholders believe the relationship between successful student behaviors and successful student outcomes are causative, rather than simply correlational. For example, students, parents, and other stakeholders might wonder why complying with interventions suggested by learning analytics systems doesn't guarantee a better grade or other desirable result (ECAR-ANALYTICS Working Group, 2015).

A final challenge is that learning analytics initiatives pose a myriad of ethical questions. For example, are institutions who possess learning data required to act on it? Might learning data be used to "profile" students? Will students flagged by a learning analytics system be treated differently? Could labels such as "at-risk" unintentionally become self-fulfilling (EDUCAUSE, 2011)? These ethical questions, data quality unknowns, organization culture issues, and data privacy and security concerns must all be addressed by institutions striving to overcome the challenges of learning analytics initiatives.

What can librarians do to prepare for institutional learning analytics initiatives?

In order to achieve the goals and mitigate the challenges of learning analytics, librarians should anticipate the adoption of learning analytics initiatives at their institution. Librarians can prepare themselves by connecting with institutional colleagues, asking questions, recognizing and developing relevant skills, and cultivating a culture conducive to learning analytics progress.

Connect with influential leaders and partners.

Librarians interested in pursuing learning analytics should identify the individuals and units that are leading their institutional involvement in learning analytics culture development, system selection, and intervention planning. Leaders responsible for championing learning analytics include a range of positions: chief academic officer, chief information officer, chief learning officer, chief data officer, director of institutional research, chief financial officers, or even the institutional provost, president, or chancellor (Lonn, Nixon, Blink, & Dahlstrom, 2015). Librarians also need to identify key units that are influential in the learning analytics conversation on campus. On most campuses, learning analytics services are housed either in institutional research units, information technology units, or a combination of the two (Lonn, Nixon, Blink, & Dahlstrom, 2015). While these positions and units provide a place to start, librarians on individual campuses will have to investigate their local situation, perhaps beginning with institutional leaders and units focused on student success, learning assessment, information technology, and institutional research or effectiveness.

Ask questions.

Once librarians have identified campus leaders and units focused on learning analytics issues, they can move forward by asking a number of questions about the institutional environment and readiness for learning analytics ventures, the data that may be appropriate to include in learning analytics systems, and the library's potential role in learning analytics.

Librarians can begin an environmental scan of campus learning analytics readiness by asking these important questions:

- Is the campus culture supportive of data-driven decision making and continuous improvement (Norris & Baer, 2013)?
- Is the campus currently considering a learning analytics system? Has one been selected? Is one in use?
- Are institutional systems and tools ready and sufficient for learning analytics projects?
- Are institutional policies and procedures ready and sufficient (Sclater & Bailey, 2015)?
- What do stakeholders (students, parents, faculty, administrators, or others) need to know or learn to "buy in" to learning analytics?

Librarians at institutions that are beginning to engage with learning analytics might have additional data-focused questions, such as:

- How long is data from each relevant learning analytics system retained? What about the data feeder systems that contribute to the learning analytics system? What happens to historical data?
- How much coverage does each data feeder system provide? Who or what is omitted?
- Which potential data feeder systems can contribute information to the learning analytics system? Which data feeder systems comply with compatibility standards? Which educational data feeder systems are "siloed" and therefore cannot make data available to the learning analytics system?
- What additional tools are necessary to support collection, description, analysis and reporting of data?
- Are there relevant institutional policies or local/state/federal laws about data protection that need to be considered? Are those protections in place?

At institutions that have committed to a learning analytics future, librarians can also ask questions to clarify the library's role as well as advocate for library inclusion in learning analytics processes. Initial questions might include queries about the library's role in learning analytics, such as:

- How can librarians participate in learning analytics discussions on campus?
- How can librarians aid in the evaluation and selection of learning analytics systems?
- How can librarians engage in the creation of learning analytics policies and procedures?
- How can librarians help manage or curate learning analytics data?
- What permissions can librarians have in learning analytics systems?
- Will the library provide feeder data? Is the library ready to do so? What would it take to get ready?
- Will the library assist with interventions resulting from learning analytics processes? Is the library ready to do so? What would it take to get ready?

Librarians who have asked and answered these questions will be prepared to gauge their institution's readiness for learning analytics, anticipate impending learning analytics data opportunities or concerns, and formulate strategies for playing a central role in learning analytics initiatives.

Recognize and hone relevant librarian skill sets.

Institutional learning analytics initiatives require the involvement of higher educational professionals with a wide range of skills, and many librarians are well positioned to contribute to an institutional learning analytics capacity. Some key learning analytics skills include: data literacy and data science facility, research expertise, intervention planning and deployment

capacity, and instructional design ability (ECAR-ANALYTICS Working Group, 2015). Academic libraries are comprised of numerous individual positions and units that specialize in these areas. Research data management and data curation librarians understand data analysis, description, interpretation, and visualization and are fluent in data literacy concepts. Reference librarians offer expert research skills, including the ability to remain current in learning analytics information resources, and education liaison librarians understand the structure of educational research questions and the relationships between educational data sets and sources. Instruction librarians can help their campuses develop strategies, policies, and plans for interventions and provide guidance on the right types, times, and tones of those interventions. They also offer advanced knowledge of backwards design, outcomes assessment, improved pedagogy to address curriculum or content trouble spots—all skill areas that can be leveraged to help institutional leaders, academic advisors, and faculty address problems surfaced by learning analytics.

Cultivate a culture that supports the adoption and use of learning analytics.

Finally, librarians preparing for institutional learning analytics initiatives can help develop a campus culture to support learning analytics. Institutions are ready for learning analytics projects when they have a number of facilitating elements in place, including:

- Understanding of student success and institutional goals
- Understanding of challenges to student success and institutional goals
- Structures for data-driven decision-making and action-taking
- Senior leadership commitment
- Stakeholder participation
- Institution-wide collaboration
- Data (availability, quality, accurate inventory of feeder systems, etc.)
- Policy support
- Resource support (financial, staffing, technology, etc.)
  (Arroway, Morgan, O'Keefe, & Yanosky, 2016)

Librarians can support many of these elements of learning analytics readiness.

Librarians can cultivate a learning analytics culture in other ways as well. They can identify and clarify institutional student success goals and challenges that could be addressed by learning analytics. Librarians can devise and conduct searches to determine the status of learning analytics at similar institutions and share that information with decision-makers. They can evaluate and select learning analytics systems offered by vendors or other sources. Librarians can conduct an institutional data inventory or audit, and they can examine and assess data, privacy, or other relevant institutional or governmental policies (Arroway et al., 2016).

Librarians can join institution-level committees and task forces, leverage their multidisciplinary background to deploy "silo" busting skills, engage in campus dialogue and decision-making, and become visible partners and champions of learning analytics initiatives. They can frame institutionally-significant research questions that can be answered by learning analytics and

narrow a prioritized list of questions to address the most pressing institutional problem areas. They can build relevant learning analytics skills and volunteer to be early adopters. In multiple ways, librarians can be an integral and valued part of the larger campus conversation leading to learning analytics initiatives.

Be ready!

Higher education is moving inexorably in the direction of using data to advance student success, and learning analytics is a linchpin toward this end. Librarians can engage in the learning analytics process on their campus if they are aware of the major goals and challenges of learning analytics, connect with institutional colleagues, ask questions, recognize and develop relevant skills, and cultivate a culture conducive to learning analytics. Armed with this preparation, librarians will be ready to hit the ground running and serve a strategic and educational purpose as their institutions commit to learning analytics.

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