Chapter 3
Using Data Analytics to Foster the Instructional Quality of Online Education

B. Jean Mandernach
Grand Canyon University, USA

ABSTRACT

The growth of online learning has spurred interest in how administrators can (and should) utilize data to drive teaching evaluations, decision-making and program oversight. Within the realm of higher education administration, online learning programs offer a distinct advantage over their campus-based counterparts: tangible artifacts. The reality of online teaching and learning is that every interaction creates a digital footprint of the teaching-learning dynamic. While researchers have actively explored how the data from these digital footprints can be used to enhance student learning, less attention has been given to how administrators can utilize data analytics to foster the instructional quality of online education. Beyond learning analytics, teaching analytics provide valuable insights that allow administrators to efficiently evaluate the quality of online teaching, proactively support faculty, and make informed program oversight decisions to maximize the online learning experience.

INTRODUCTION

As colleges and universities respond to the growing demand for online courses (Allen & Seaman, 2015), administrators are faced with the challenge of ensuring the quality of online courses and programs. While the need to monitor, document, and support educational quality isn't unique to the online environment, the challenge may be intensified due to the nature of online education. Simply put, students' options for attending college are not limited as a function of geography; the ubiquitous nature of virtual education creates a highly competitive marketplace in which students can 'shop' for the best educational experience. In this context, it is essential that institutions provide a high quality educational experience that can attract and maintain online students. Complicating the matter further, budget challenges are prevalent across higher education (Rogers, 2015). The clashing pressure to assure a high quality online learning

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experience with a reduced budget is intensifying the need to identify tools and strategies that can foster the educational experience in an efficient manner.

While many components impact the overall quality of an online learning experience (e.g., curriculum, learning management system, course design, content, etc.), research consistently identifies instructional quality as a key factor in the teaching and learning dynamic (Dennen, Darabi & Smith, 2007). The importance of teaching effectiveness doesn't vary as a function of whether a course is taught online or face-to-face; but there is a fundamental difference in monitoring instructional quality between online and face-to-face instruction: evidence. Unlike its face-to-face counterpart, online teaching produces tangible artifacts of instructional activity. Virtually every learning management system (LMS) includes analytic functions that record various individual data points along with collective repositories of 'big data.' The every-click-tracked infrastructure of LMSs provides documented indicators across a wide range of faculty behavior and performance (Tobin, Mandernach & Taylor, 2015). For example, teaching artifacts might include quantitative data on the frequency, number, and timeliness of logins, announcements, discussion board postings, feedback and related online instructional activities. While administrators must be cautious in using isolated indicators of behavior (an issue which will be explored later in this chapter), the integration of teaching analytics has the potential to increase the efficiency and effectiveness of administrative decisions. The purpose of this chapter is to assist online learning administrators in understanding the application of teaching analytics to enhance evaluations of online teaching, faculty support and program oversight.

TEACHING ANALYTICS

Data analytics have quickly become an integral component of a comprehensive approach to improved decision-making across higher education (Desouza & Smith, 2016). The value of data analytics rests in its ability to help administrators make more informed and more efficient decisions (which, in turn, results in more effective use of limited resources). From predictive analytics to learning analytics to institutional analytics, data-driven decision-making has the potential to inform virtually all aspects of the institution. Considerable research has explored the power of learning analytics to foster student achievement and tailor learning experiences to the needs of individual students (Johnson, Adams, & Cummins, 2012), but less attention has focused on the application of teaching analytics to enhance the faculty experience or instructional quality.

Just as student activity in the online classroom leaves a digital footprint to inform learning analytics, instructional activity creates an equally impressive array of data on teaching behaviors. Learning management systems have integrated analytic capabilities that have the potential to measure a range of teaching activities (Tobin, Mandernach, & Taylor, 2015); for example:

- **Notifications:** Notifications include one-to-many options for updating students on course-related content or activities. In many LMSs this is a handled via the "announcement" function. In addition, this may be captured as a function of the "message" feature in which notifications are sent to the entire class. Teaching analytics related to notifications may include:
    - **Number of Announcements:** Number of announcements can be measured via overall frequency captured as a single metric spanning the duration of a course or as a frequency dis-