

Opportunities and Barriers in Using LMS Data for Student Success

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Abstract: Learning Management Systems (LMS) are used to plan instruction, share materials, and record interactions. How can instructors utilize reports from the LMS and external tools to make timely, data-driven decisions? The authors highlight ways that instructors can use data from Desire 2 Learn reports, along with additional qualitative data, to drive instruction. Implications suggest ways to use multiple forms of data to support instructional decisions that meet students' learning goals.

A latent data source for data-driven instruction

In the recent decade, significant attention has been paid to data-driven instruction, but data-driven decision making is not new to education. What *is* new is a more nuanced approach to data collection and data analysis, in what can best be described as using data to drive instruction and support students in achieving their learning goals (Smith, 2017). In this approach, data, both the analysis and interpretation of it, are focused on gaining insight from students' interactions with course material in order to pinpoint where they are struggling. As a result of interpreting the data, instructors can then adapt instruction to meet their students' needs. This project offers ways to examine and implement a data-to-inform instruction approach in courses offered through the Desire to Learn (D2L) learning management system (LMS).

Small-scale study of the use of data to drive instruction

LMSs, first introduced in the late 1990s, have been transformed from the early systems that simply delivered course content to distance learners to “dashboards or web-based platforms that enable instructors to plan, evaluate, automate administration, manage communication, and implement the learning process” (Ellis as cited in Correia, 2018, p. 93). Today's LMSs are designed to manage the roles of students, teachers, and administrators, thus enabling the scalability and easy re-use of instructional materials (Correia, 2018). We believe the next transformation of the LMS will facilitate timely access to data capable of driving instruction. However, in order for it to inform instruction, it must be made actionable and then acted upon.

In anticipation of this next transformation, our team, individuals with pedagogical content knowledge as well as the skills required to gather and analyze data, came together to operationalize Gummer & Mandinach's (2015) conceptual framework of data literacy for teaching. Together we considered how students learn, how assessments work, and how curriculum is developed. We determined what quantitative data was available in D2L and we considered what insight it might provide about students' performance and behavior. We supplemented the data available from the LMS with qualitative assessments in order to gather attitudinal and motivational data. Our research examines data and data collection methods that provide information to enable us to identify problems, frame questions, develop interventions, and evaluate outcomes.

Of particular interest is the students' self-awareness of their learning collected through other qualitative means. In subsequent phases of analysis, we will match quantitative data from D2L with students' self-report data to assess whether students can accurately gauge their own progress. This is important because an interactive workbook lies outside of the D2L data extraction parameters. This workbook is meant to enhance the chances of students' success in transferring the skills developed in the course to subsequent coursework. There was limited data available that could be gathered within the LMS to examine use of this external workbook.

Methods

Participants

Participants are students at a large Research 1 state university in the Southwest U.S. (20 students; 13 males, 7 females) who took a one-credit accelerated, online asynchronous course that was designed to teach basic Excel® skills. The course is required for the undergraduates (n=19). It was an elective for the graduate student (n=1), who was using the course to acquire skills for academic research. The skills acquired in this class provide a foundation for subsequent major coursework.

Measures

To ensure the accuracy and validity of our measures, we gathered multiple sources of evidence related to the

students' attitudes and feelings about Excel®, their level of knowledge and ability, and their self-perceived and actual progress throughout the course (Oliver-Hoya & Allen, 2006). Assuming that students may be intimidated by the prospect of learning Excel® online, student-created memes were incorporated into the first assignment. Their use served a two-fold purpose: 1. to archive each student's initial perception of Excel® and 2. to create a comfortable learning environment, one where the students would be able to build rapport with the instructor and feel safe sharing their feelings and attitudes (McCabe, Sprute, & Underdown, 2017). Moving forward from this introductory exercise, qualitative data was gathered weekly. Data included surveys with Likert-scale responses to gauge the students' confidence levels, activity logs to gauge the students' perceived effort and level of difficulty of the assignment, Flipgrid® reflections to assess what learning activities had been useful and how their immersion in the content might be shifting their thinking about what Excel® is and how it can be used, and supplemental data gathered through email correspondence. Additionally, quantitative student data were gathered from the LMS. These data included: log-in times and dates, course access progress, engagement with content down to the topic level (reported by number of visits and time spent), assignment submittals, and quiz statistics.

Data analysis

Data were collected, organized, and archived for further analysis and will be compared with second semester data. Initial insights are reported here.

Results

Although participation in the various qualitative collection methods was robust (80%), the self-reported qualitative data regarding the level of difficulty of the lesson and the time needed to complete it was not accurate enough to be actionable. However, answers to the weekly activity log questions: *What were your challenges this week?* and *What worked well for you this week?* were a rich source of insight for both the students and the instructor. Analysis of the responses enabled instruction to be pivoted. For example, a video library was added to the course site to provide students' feedback. This instructional tool seemed to meet the needs of some learners and provided individualized support based on students' strengths and weaknesses. Additionally, required student reflections completed weekly appeared to create independent learners who came to value the process of learning beyond earning a grade. This was evidenced by the fact that even after students had earned their final grade in the course, they were re-submitting their final assignment to "get-it" right.

Additionally, the student-created memes, as well as the instructor's timely response to student's concerns voiced in the surveys or reflective activities, successfully built a rapport with the students. By lesson three, the students were reaching out when they were struggling and asked for additional assistance prior to completing assignments. In other words, students appeared to switch from a reactive to a proactive stance regarding their assignments.

While not implemented in this course, our research revealed that quantitative data gathered through D2L quiz statistics could also offer instructors a way to pivot instruction to better meet students' needs.

Discussion

Given that this is the first time this approach has been implemented, the process of finding the data in D2L, and associating it with the qualitative data must be viewed as work in process. The first semester was used to remedy difficulties, find gaps in the data, and work with the vendor for D2L and the University's IT department to obtain access to any additional data that would aid instructors in adapting a data-driven instructional approach. Next semester, the weekly qualitative data will be triangulated with the quantitative data (Oliver-Hoya & Allen, 2006) in order to make shifts in instruction throughout the course. Results of this will be discussed in the poster session.

References

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