Chapter 57
Moving Targeted Online Learner Analytics Into the Hands of Teachers

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ABSTRACT

Every time that a student uses the internet on a school-issued computer, a trail of data about their online learning experiences is created. Until recently this data has largely gone unnoticed for educational purposes. This chapter will explore how research into the use of student online behavior data can be used to improve teaching and learning in digital environments. Techniques for the collection and analysis of targeted online learner analytics (TOLA) will be presented along with the findings for how TOLA impacted the teaching and learning process of real classroom teachers. The powerful and new form of data has the potential to disrupt the status quo of education, and this chapter will take a research-based look at that future.

INTRODUCTION

There has never been a time in the history of education when so much information about student online learning behavior has been collected. Every time a student browses the internet, accesses online content, Googles a question or types in a Google doc, a record of activity is created. This activity is essentially a descriptive pathway of learning that is marked with the breadcrumbs of student internet browsing data. Unfortunately, much of this valuable data about student online learning experiences is not being utilized for instructional purposes.

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The field of learning analytics has made some strides in helping educators make sense of this underutilized data, but by in large learning analytics has had little impact on K-12 public education. Analytics has not had the transformative and disruptive impact on education as it has had in other fields of work.

This chapter will explore the groundbreaking potential of Targeted Online Learner Analytics (TOLA) in the design of instruction that optimizes student learning. Two research studies will be presented. Both studies looked to understand how information about student online activities could affect change within schools. Insights gained from the studies will be explored and a vision for how TOLA has the potential to disrupt the educational setting will be presented.

BACKGROUND

Defining Analytics and its Emerging Impact on Education

Using data to make decisions is an obvious best practice that improves organizational outcomes and productivity (Long & Siemens, 2011). The act of collecting data to measure, compare, and improve performance is at the core of analytics. Analytics has been successfully used in settings outside of education to support operational decision making. Ultimately, the goal of analytics is to provide the user with information and data to make informed decisions, with the goal of improving performance (Papamitsiou & Economides, 2014; Radu, 2017). According to the Society for Learning Analytics Research, "Learning analytics is the measurement, collection, analysis, interpretation, and reporting of data about learners and their contexts, for the purpose of understanding and optimizing learning and the environment in which it occurs…." (Wilson, Gochyyev, & Scalise, 2016, p. 2).

Unlike the sciences and industry, the educational community is late in its adoption of analytics to improve performance (Baker & Inventado, 2014). Only recently has it begun to explore analytics as a tool to gain insight into student-learning online (Papamitsiou & Economides, 2014). It has been referred to as a game-changer for teaching and learning (Drachsler & Greller, 2016). The use of analytics in education has gained more acceptance in recent years for four reasons. The first reason is that the quality of the data collected has improved in quality and quantity. Increased access to and use of technology in schools across the nation has led to an increase in the quantity of data available to educators. In most schools, each time a student uses a digital device to interact with content, that interaction is logged and made available for further analysis. The scope of the data that is collected during learning activities has increased exponentially as large textbook companies like Pearson and McGraw-Hill become interested in learning analytics (Baker & Inventado, 2014).

Second, the format by which the data is reported is more user friendly. Previously, educational data that was logged electronically was cumbersome to organize for the purposes of analysis and interpretation. Effective logging mechanisms of educational data have been standardized, which has led to more usable and manageable forms of analysis and interpretation for educators (Baker & Inventado, 2014).

The third reason the use of analytics has gained acceptance in education is the advances in computing. The increased processing and computational power of digital devices makes it much easier to accomplish tasks. Specifically, advances in computing have led to the ability to analyze large quantities of data from multiple sources in a shorter amount of time (Baker & Inventado, 2014).