Chapter 4

Understanding Emotional Analytics for Student Engagement:
An Instructional Design Perspective

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ABSTRACT

Online instruction in institutions of higher education (IHEs) is growing at an unprecedented rate, which makes student engagement an increasingly important research topic. Emotion plays an important role in student engagement because it can affect motivation, self-regulation, and academic achievement of students, especially in an e-learning environment. Measuring emotions has limitations and presents challenges because people display little change in their emotions while they are learning. The purpose of this chapter is to place in perspective the status of research relative to understanding emotional analytics as they influence the engagement of students in online learning involving visual displays, and the importance of effective visual presentation of learning contents. Central to this goal is a focus on techniques for measuring students' emotions.

INTRODUCTION

Throughout the emergence of online learning in institutions of higher education (IHEs), the Babson Survey Research Group has conducted multi-year surveys documenting the rapid increase of students enrolling in online distance-education courses. As online offerings increased, so did the positive student perceptions of the effectiveness of online education (Allen, Seaman, Poulin, & Straut, 2016; Lee, 2016; Woodall, 2017). With advancing educational technologies, new possibilities emerged for engaging students in active learning, student-centered classrooms, and the routine use of visual materials (Gilbert, Sim, & Wang, 2005; Salmon, 2013; Feldman, Nation, Smith, & Besalti, 2017). Emotion has emerged as an important element of the learning experience, but many questions remain about emotion in education (Pekrun, 2005). Many emotional engagement studies have been conducted in traditional academic learning situations. However, a distinct body of literature raises questions about the quality of online instruction, retention, student performance, and lack of engagement, as well as issues related to the need for research (Carr-Chellman & Duchastel, 2000; Herbert, 2006; Pellas, 2014; Salmon, 2013; Mayer, 2014). Few studies discuss the differences between online learning and traditional learning with respect to emotional engagement experiences. Marchand and Gutierrez (2012) identified instructional design as one factor that can predict positive or negative student emotions. Previous research on emotional engagement in instructional design and its important influence on learning is interdisciplinary. This chapter divides approaches to that research question into theoretical research and empirical research. The theoretical research is presented in the context of needed improvements in instructional design for online instruction, including design strategies that would inform such improvements. The empirical research attempts to determine whether online instructional representations, which include embedded design principles, can enhance students' affective learning experience. This chapter contributes to methodological knowledge for conducting research on the implications of instructional design for emotional engagement.

MAIN FOCUS OF THE CHAPTER

The goal of this chapter is to place in perspective the status of research relative to understanding the influence of emotional analytics on student engagement in online learning involving visual displays, and its importance for effective instructional design. Central to this goal is a focus on techniques for measuring students' emotional analytics in digital instructional design. A more interdisciplinary line of research on the engagement of students resulted in the creation and validation of Universal

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