Chapter 72
Individual Cognitive Differences and Student Engagement in Video Lectures and E–Learning Environments

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ABSTRACT

Student engagement is a research area which has been focused on for many years but gained growing interest especially in recent years. Studies in the literature indicate that there is an agreement on the relationship between learning outcomes and student engagement in school and classroom context. But, what is not yet clear is the impact of cognitive individual differences of learners on student engagement, especially when exposed to video lectures. Thus, this chapter focuses on understanding individual cognitive differences in order to improve student engagement. The rest of this chapter will be organized as follows: Firstly, student engagement is defined based on different engagement models with a special focus on video lectures. Secondly, previous research will be reviewed to discuss the relationship between student engagement and cognitive individual differences. This is followed by recommendations that can be used for further student engagement research.

INTRODUCTION

The widespread use of information and communication technologies by learners and instructors in education has created a paradigm shift in educational contexts including learning environments, learner preferences, instructor behavior, and learning materials. The role of new technologies in education has initiated the use of new emerging pedagogical models, including e-learning. E-learning provides several benefits to all types of learners. In e-learning environments, greater learner diversity creates a wider variety of learner needs and preferences. Instructional designers should consider such learner variability through more personalized e-learning environments, enabling learners to obtain greater benefits from the learning materials (Kinshuk, Chang, Graf & Yang, 2010).

Videos can be a rich and powerful learning medium that are attractive to learners as well. According to the Cisco Visual Networking Index report, global internet video traffic will account for 82% of all internet traffic by 2022, up from 75% in 2017 (CISCO, 2019). Studies focusing on video learning materials have shown that learners have greater satisfaction (Sadik, 2016), learning performances (Giannakos, Jaccheri & Krogstie, 2016; Giannakos, Chorianopoulos & Chrisochoides, 2015), retention (Hung, Kinshuk, & Chen, 2018), and engagement (Deslauriers, Schelew, & Wieman, 2011) and better learner experiences (Kizilcec, Bailenson, & Gomez, 2015). The study of students' learning and engagement with video lectures is an emerging study area in the instructional technology literature.

Although student engagement has become a popular topic, it has not been studied thoroughly from the perspective of individual cognitive differences. In addition, the key issue of how to keep students engaged in learning plays a critical role in the effective learning design process. Therefore, the purpose of this chapter is to present reflections on the current empirical findings of student engagement studies in the context of video lectures and cognitive individual differences. First, student engagement will be defined based on different engagement models and student engagement in video use will be explained, considering related empirical findings. Second, the relationship between student engagement and cognitive-based individual differences will be discussed using previous studies. This will be followed by some recommendations and critical questions that could be used for further research into student engagement in video-based e-learning environments.

STUDENT ENGAGEMENT

Student Engagement Models

Engagement is one of the most widely overgeneralized and misused concepts in the field of learning and psychology (Azevedo, 2015). Student engagement aims for increased achievement, positive behaviors, and a sense of belonging for students so they continue to learning activities. Studies since the early 1990s exploring how student engagement could be increased indicate that engagement could be increased through the utilization of technology-supported designs (Kearsley & Shneiderman, 1998), particularly when creating personalized learning environments in e-learning.

Student engagement can be defined as the active involvement of students in a learning activity and any interaction with instructors, other students, or the learning content through the use of digital technology (Christenson, Reschly, & Wylie, 2012; Henrie, Halverson, & Graham, 2015). According to Skinner and Belmont (1993), engagement occurs when students are involved in learning activities with positive

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