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ABSTRACT

Many studies have shown that instructional videos can be a highly effective educational tool. In particular, Hsin and Cigas, (2013) describes the outcome derived from using video mini-lectures in an introductory course in computer science/mathematics. Student withdrawal, the failure rate, time-intensive interactive chats and written communication by the instructor was reduced after adding the videos to the class. Students were more satisfied with the course and average grades in the course increased slightly.

Numerous other studies have shown that Effective videos are designed and implemented by balancing three elements: 1. cognitive load, 2. student engagement, and 3. active learning (Brame, 2015). This study develops a coding schema that will identify if the instructional videos in a simulation software package are designed and implemented by balancing the three elements. In addition, it explores if students use the instructional videos effectively when offered as part of a simulation software package. This is done by empirically coding and testing the quantitive data derived from the simulation reports using the appropriate statistical method.

The simulation package gives students:
1. instructions for completing the skill (Cognitive Load)
2. the opportunity to observe the skill with voiceover and on-screen callouts (Cognitive Theory of Multimedia Learning)
3. the opportunity to walk through a guided practice where they control the keyboard and mouse. (Student Engagement)
4. Students must apply their skill unaided in a simulated Microsoft Office and computing environment to receive credit for completing the task. (Active Learning)

The researchers expand the use of video mini-lectures to using a simulation software package that includes observing a video, practice the steps in the video and apply skills in simulated environments. Videos used in combination with simulation software can be an effective tool when designed and used correctly. The three elements and the instructional methods in the simulation package are mapped to several recommendations given by Brame, 2015 about developing educational videos.

This study suggests that when incorporating videos into student learning, it's important to keep in mind these three key areas: cognitive load, student engagement, and active learning. In addition, a few recommendations for selecting effective videos are derived from these theories and are described. This is an important study which can help educators more effectively use video and simulations as an educational tool.

Keywords

Simulation, Instructional Video

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