Use of an Online Simulation to Promote Content Learning

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ABSTRACT

Educators seek effective methods of teaching concepts in ways that engage the learner. One potential method involves the use of simulations, including online simulations. In this exploratory study, researchers examined the pretest and posttest written products of 30 preservice social studies teachers to determine the amount and depth of knowledge before and after taking part in an online simulation. Results indicated that gains in knowledge from the pretest to the posttest were statistically significant, but that the depth of knowledge gained was rather limited in scope. Findings have implications for those considering using or designing online or other simulations as content learning tools in the social sciences and other educational fields.

Keywords: Content Learning, Education, Genocide, Online Simulation, Pre-Service, Social Studies Education

INTRODUCTION

The idea of a simulation to support academic goals and outcomes, including knowledge of concepts, facts, strategies for problem solving, and the prompting of positive changes in student perceptions and attitudes has appeared in educational literature since the 1960s (DeKock, 1969; Yount & DeKock, 1969). According to Gratch, Kelly, and Bradley (2007), simulations are models that re-create events, issues, or phenomenon and that provide complex systems or scenarios in order to allow learners to engage in reasoning or problem solving processes. Given the prevalence of electronic media, simulations have the potential to be popular learning tools. Simulations present students with authentic scenarios that require them to behave as they would in the real world, testing their theories and applying their knowledge in order to complete a variety of complicated tasks (“Simulation Spreads From,” 2012).

Much has been written about computer simulations and their classroom efficacy. Using simulations students have opportunities to experiment with different roles and tools, hitherto unknown in their everyday life. In the engaging environment made possible by simulations, students have the potential to learn important critical thinking, reasoning, and problem solving skills along with decision-making and strategizing skills (Gratch, Kelly, & Bradley, 2007; Li, et al., 2012; Liu, Kinshuk, Lin, & Wang, 2012; Prensky, 2000; Prensky, 2006; Pillay, 2003;
Ronen & Eliahu, 1999). For example, computer simulations allow medical students to practice and perform surgery without risk of harming a patient and students of history to take a safe, yet engaging journey across 19th century America in a covered wagon. Additionally, the design of computer simulations can argue learning in that students are often cast as beginners in simulation scenarios and must perform certain digital acts of learning, utilizing specific facts, commands, or procedures in order to move to the next level of learning (Lindgren, 2012).

Simulations can be used as a way to assess student learning as well. Data from simulations can measure not just what answers are correct, but also other aspects of student problem-solving abilities; for example, how well students use information and tools, their understanding of the simulation and the issues presented in the scenario, as well as illuminate choices made each step of the way that led students to better or worse outcomes (“Simulation Spreads From,” 2012).

Finally, simulations allow students to expand their perspective on any given subject. They can explore and learn about new identities in virtual environments (VE) that situate them in contexts as competent participants in a realistic and complex system of activity. Within this virtual environment students may develop the skills, values, and tools of a proficient member of the virtual community. Whatever role they choose in the scenario, self-efficacy and positive identification with this role is increased (Li, Chen, Wang, & Heh, 2012; Lindgren, 2012). Additionally, research has shown that simulations can be used to promote attitudinal states such as empathy among users (Archer, Clayton Foushee, Davis, & Aderman, 1979; Harris & Foreman-Peck, 2004; McAllister, 2002; Seixas, 1993).

Online and other digital simulations support the constructivist concept of “learning by doing” (Gee, 2003; Prensky, 2006). In contact with environmental influences such as those represented in a simulation, students actively construct or create their own subjective understanding of whatever objective reality is presented taking new information and linking it to prior knowledge (Bednar, Cunningham, Duffy, & Perry, 1995).

The constructivist philosophy of learning also focuses on the social and intellectual learning environment as a catalyst for meaningful learning (Piaget & Inhelder, 1969; Vygotsky, 1986). The social and intellectual learning environment expands for students playing computer simulations, thus enriching the relevance and meaningfulness of the knowledge, skills, beliefs, and attitudes connected to the learning that goes on inside the classroom (Bruner, 1991; Caine & Caine, 1994; Jones & Chang, 2012; Levstik & Barton, 1997). The manner in which the content of a simulation is presented (i.e., “real-time” and visual) further promotes meaningful learning. Simulations, such as the one used in this study, allow the learner to look deeply into a concept or event by using primary and secondary source materials, including music, texts, pictures, diaries, biographies, and/or other documents, that go beyond the textbook (Schunk, 2011; VanSledright, 2002). Thus, the visualization and pictorialization of multimedia learning tools can facilitate pedagogy (Barker & Philip, 2011; Jones & Chang, 2012). In fact, simulations are so motivating that even if there is little prior interest in the subject area, within the ongoing gaming session, intrinsic motivation has been shown to rise (Sørebo & Hæhr, 2012). Other research on simulations has provided a motivational link between students’ interests in gaming to “engagement in civic and political activities” (Lenhart, et al., 2008).

Given the instructional and motivational potential of simulations, it is important for pre-service teachers to have training in current and emerging technologies within the context of a methods course where research supported instructional methods can be modeled successfully. The purpose of methods courses is the development of effective teachers who understand a variety of methods and recognize the variety of ways learning can occur (Bransford, Darling-Hammond, & LePage, 2005; Molebash, 2004; Owens, 1997). However, many teachers are resistance to change—and to the use of new technologies (Joram & Gabriele, 1998), including online simulations. Research
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