

## Chapter 50

# Virtual Learning: Videogames and Virtual Reality in Education

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### **ABSTRACT**

*This chapter explores the seamless learning opportunities that video games and virtual reality offer for learners and instructors. Interacting with content, with each other, and with learning processes in virtual environments, learning becomes a process combined with discovery and fun. The authors analyze emerging trends and learning understandings (epistemologies) built by video game users and learners represented in the forms of avatars. Digital environments are in fact transforming the way learners and instructors (faculty) interact with each other in and across contexts. Using data from two parallel research projects, the chapter examines students' self-identity construction, problem solving, and learning in virtual environments. The authors suggest that learning epistemologies that take place in virtual reality should be brought back to the classroom or to the online environment (by the instructional designer or the game developer) and impact the way learning takes place in this 'real'/physical environments.*

### **INTRODUCTION**

There has been a steady growth in interest about how digital video games can support educational outcomes inside and outside the classroom. As with many technologies, teachers and academic administrators, (who are interested in games for teaching and learning), need to keep pace with the dynamic and changing technology environment of the video game and virtual reality (VR) industries. Video games and VR are one of the most innovative areas of technology development today and are constantly presenting new ways of delivering learning opportunities to their players. It has only taken a few short years for gaming

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and VR to change from a mostly desktop computer-based activity to becoming available on a wide range of technology platforms. The recent rise of mobile gaming has made video games almost ubiquitous in our current culture. Each new technology makes games more accessible to players. The challenge for educators and administrators is keeping up with all the changes and then exploring the educational possibilities presented by each new technology. Some teachers are currently using games that were designed for the entertainment market and then creating supporting curriculum in order to use them in the classroom. Other teachers are using video games that have been designed for education and already have curriculum support either embedded in the game or provided outside the game to support their use.

The main objective of this chapter is to analyze the impact of video games and virtual reality in seamless learning in the context of two research case studies in which the use of video games and virtual reality have had a strong impact in students' learning experiences. A framework from both the instructor's (or lecturer) and the student's perspective to analyze how seamless learning takes place when learning interactions happen in virtual worlds is provided and further areas of research are explored.

## **BACKGROUND**

More than 300 million people play social games every month (Wexler, 2011). Not surprisingly the persuasive nature of video games has attracted educational researchers and teachers interested in the potential of the new medium in teaching and learning. For more than decade now, higher education & K-12 institutions have been exploring the use of video games and other VR spaces to support teaching and learning. Virtual environments allow for interaction, exploration and creation, providing a place where learners can build exact replicas of famous buildings (for an architecture course), or interact with world known personalities (for a science program), or buy a time share condominium to spend a holiday (while they learn the details of a financial transaction). Furthermore, a number of universities around the globe have started, and continue to do so, to build virtual scenarios where students could meet for a coffee, or to exchange and academic idea, or to find a problem for a solution, or to consult with their instructor.

In a recent survey of American K-8 classrooms 74% of teachers reported using digital games for teaching. 80% of those teachers said their students play at least monthly while 55% said they played weekly. This gameplay time was not for entertainment purposes as teachers were using games to address curriculum needs at a local (43%) and state/ national (41%) curriculum standards. The games are also being used to assess students on supplemental (33%) and core knowledge (29%) (Takeuchi & Vaala, 2014).

Higher education institutions are also using virtual worlds to connect with young learners, in an attempt to engage the so called 'Net Generation' – and their use of gaming and computer generated virtual worlds for entertainment - into their programs and course offerings. Examples of these are the beautiful student centered developed in Second Life by Ohio University, and the Campus welcome model built in SL by Athabasca University (Burkle, 2010).

The research into video games and virtual environments has been fueled by an increasing number of claims about the value of video games and digital environments. Those who see the beneficial results of video games have a long list of positive effects. These include a host of cognitive skills such as an increased ability to problem solve, filter misleading perceptual information, tolerate failure, exhibit greater creativity in problem solving, and exhibit higher levels of competitiveness and greater optimism (Bialystok, 2006; Aldrich, 2005; Unsworth et.al., 2015).

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