

Chapter 2

Virtual Reality Pedagogical Considerations in Learning Environments

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ABSTRACT

New virtual reality (VR) educational applications are available in the electronic marketplace almost daily but seldom include pedagogies, materials, recommendations, or insights for adapting or implementing the applications into existing curriculums. Educators need to understand the pedagogical orientations of VR applications to prepare, apply, assess, and evaluate a potentially productive practice that distinguishes and supports different strategies and optimizes student-centered learning. VR educational applications are most frequently built on student-centered models including direct instruction, experiential, discovery, situated cognition, and constructivism pedagogies.

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THE CONTEXT OF STUDENT-CENTERED VR EDUCATIONAL APPLICATIONS

Virtual reality (VR) could be valuable especially when mastering challenging, tiresome, or hazardous tasks (Janssen, Tummel, Richert, & Isenhardt, 2016). Collaborative and interactive learning is possible in student centered VR educational experiences. VR can be less expensive, provide support for diverse learners, support ESL learners and others with literacy challenges. Student centered learning in collaborative groups can support critical thinking. Students can envision, apply, and understand complex theoretical models more effectively through VR experiences as opposed to within a traditional classroom. (Friena & Mott, 2015). The potential of VR clarifies the need to effectively implement the VR educational applications.

THE VALUE OF UNDERSTANDING PEDAGOGIES

A variety of corporations, educational institutions and laboratories are developing VR applications that come into the electronic marketplace on an almost daily basis. Explicit pedagogical statements are rarely available in the new VR educational applications (Fowler, 2015; Mikropoulos & Natsis, 2011). However, national, regional, and local educational leaders and VR developers need a clear understanding of the underlying pedagogy to train personnel, develop contexts, and align the new VR applications with previous teaching and learning methods, (Stefan, Moldoveanu, Gheorghiu, 2016; Kahai et al., 2013; Lovequest et al., 2015; Psotka, 2013). In addition, educators will need to assess and evaluate the new applications (Ludlow, 2015) using comprehensive theoretical support. Clear understanding of the pedagogical foundations of VR applications for education is necessary (Conole, 2004; Fowler, 2015; Kebritchi & Hirumi, 2008; Mikropoulos & Natsis, 2011) to assure that educators can evaluate use and effectiveness (Stefan et al., 2016).

Researching Pedagogical Foundations

A directed content analysis to identify pedagogical foundations of selected VR educational applications (Johnston, Olivas, Steele, Smith, & Bailey, 2017) revealed a pattern of student-centered pedagogies. Kebritchi and Hirumi (2008) developed a theoretical model that indicated qualities of direct instruction, experiential learning, discovery learning, situated cognition, constructivist, and unclassified approaches for analyzing the pedagogies of electronic games. Both texts and visual public content were used in a comparative and deductive process. A series of key words (Appendix A) related to each pedagogical foundation was developed for the initial analysis.

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