Chapter 23
Open Source vs. Proprietary Collaborative Virtual Learning Environments

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ABSTRACT

This chapter is an evaluation of the efficiency of 3D Collaborative Virtual Learning Environments to facilitate the implementation of collaborative learning activities. Firstly, there is a presentation of the state of the art regarding open source as well as proprietary platforms. Afterwards, the use of a case study reveals issues concerning the suitability of open source Collaborative Virtual Learning Environments, rationalizing the choice of executing a collaborative learning scenario in Second Life. The specific scenario is then presented culminating in evaluation results related to the appropriateness of Second Life with regards to its technical and pedagogical affordances. Finally, students' suggestions and reactions towards such a novel didactical approach are discussed.

INTRODUCTION

Educational research (e.g., Vygotsky, 1962) has led to several theories, such as those of constructivism and social learning. Vygotsky, who is the main supporter of social learning theories, states in the basic principles of his theory that "learning and developing is a social, collaborative activity."

Collaborative Learning is rooted in Vygotsky's views regarding the social side of learning and as a general term is used for the description of educational practices based on the simultaneous cognitive and mental effort of multiple students or/and educators. Students share a common goal, depend on each other and they are mutually responsible for their success or failure.

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Several studies (i.e., Dillenbourg, Baker, Blaye, & O'Malley, 1996; Bruckman & Hudson, 2001; Karantzas et al., 2013), have proven that collaborative learning is more effective in specific educational situations in comparison to other teaching methods (e.g., competitive or personalized learning). In particular, it seems collaborative activities centered on a cognitive goal and guided and supported by experts, result in the more meaningful and efficient acquisition of knowledge.

Collaborative efforts among students result in a higher degree of accomplishment by all participants as opposed to individual, competitive systems in which many students are left behind (Slavin & Tanner, 1979). Through collaborative learning, students can be stimulated to negotiate information such as abstract, ill-defined and not easily accessible knowledge and open-ended problems. According to Gokhale (1995) collaborative learning is a beneficial method for the enhancement of critical thinking and improvement of problem solving skills. Also, collaboration enables the discussion of complex problems from different perspectives and supports learners in the elaboration, explanation and evaluation of information in order to re- and co-construct new knowledge or to solve problems (Veerman & Veldhuis-Diermanse, 2001).

The application of collaborative learning is usually hampered by the lack of motivation and engagement of learners which can be attributed to the absence of interactivity and challenge. Failing to stimulate learners, makes the collaborative experience unattractive and discourages progress. To counter this issue our main purpose is to exploit the advantages of Collaborative Virtual Environments (CVEs).

A CVE is a 2D or 3D space where students can communicate and interact with others, with agents, or with virtual objects. The purpose for students is to acquire knowledge through the sharing of ideas in the context of achieving a common goal. The architecture of CVEs is usually based on distributed and interconnected computer systems. Access to CVEs is by no means limited to desktop devices (Churchill, Snowdon, & Munro, 2001), but might well include mobile or wearable devices (Reitmayr & Schmalstieg, 2001), public kiosks, etc.

Studying the problems in the application of collaborative learning in conjunction with its pedagogical benefits, we can surmise that the most important factor in designing a CVE is the catering for immersion. Immersion happens through four processes of engagement: interest, involvement, imagination and interaction (Burbules, 2004). For the digital generation, these four aspects are to some extent shaped by their engagement with technology and the media. Therefore, educators seeking to create interesting and enjoyable learning conditions in order to attract and retain student attention will have to learn from what makes those environments so appealing to contemporary students.

Compared to tools supporting traditional teaching methods, CVEs have many advantages (Bruckman & Hudson, 2001; Dalgarno & Lee, 2010). In addition to supporting real time distance learning, advantages can vary from student motivation and amusement to the simplification of the development of cognitive models from complicated or abstract material. CVEs let users experience environments, which, for reasons of time, distance, scale, and safety, would not otherwise be available, especially to those with disabilities (Muller & Koubek, 2002; Moore, Cheng, McGrath, & Powell, 2005).

In addition, CVEs could be useful for supporting Complex Learning approaches. According to Guglielman and Vettraino (2007), "Complex learning represents the hybridization of environments, languages and interaction in a learning community composed of the whole world wide web" (p. 1). The contribution of a CVE to this hybridization is the support of distance learning and collaboration services along with traditional lectures in a class of students.