

# Chapter 11

## Collaboration and the Use of Three Dimensional Interface within a Virtual Learning Environment

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### ABSTRACT

*This chapter's goal is to examine the experiences and perceptions of undergraduate students using a 3D Virtual Learning Environment. After creating a 3D didactic constructivist virtual environment, student conversations were observed for collaborative elements. Findings revealed that five forms of collaboration amplified the learning process and indeed occurred within the virtual learning environments. Results further suggested that the 3D VLE project, though limited in time and scope, successfully created a community of learners.*

### INTRODUCTION

Virtual learning environments have allowed students and teachers to interact without regard to location or time (Hobbs, 2004). According to Dalgarno (2002, p. 3), the primary characteristics of a 3D environment include: (1) the use of 3D vector geometry to describe objects shape and

coordinates in the environment; (2) the user's view is dynamically rendered according to their location and direction that they face; (3) the user is able to interact with some objects in the environment; (4) the environment may include 3D audio. Dillenbourg (2000) further argued "the difference between other constructivist environments and what virtual environments potentially offer can be described as making students not only active, but also actors" (p. 8). However use of the 3D VLE

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as an educational tool, without good pedagogy, can hamper student learning rather than enhance it. Since collaboration is an important part of the educational process of any learning community (Bruffee, 1999) and, given that communication is necessary within a 3D VLE, collaboration has been chosen as the theoretical lens to view learning within this 3D VLE. The questions guiding this inquiry are: How does the collaboration process contribute to learning within a 3DVLE? And what are the perceptions of the students regarding the effectiveness of the collaborative process within the 3D VLE?

## **CONCEPTUAL UNDERPINNINGS**

### **Collaboration**

Why is the occurrence of collaboration within 3D Virtual Learning Environments important? According to Bruffee (1999), conversation must exist for re-acculturation to occur. Without re-acculturation, the student will not gain the essential vocabulary that is critical to the educational process. By examining conversations within the 3D VLE, it is possible to check for the existence of collaboration. Consequently, as Bransford et al. (1999) noted, "It is easy to forget that student achievement in school also depends on what happens outside of school" (pp. 16-17). By recognizing the communities and the acculturation of the learner Bruffee (1999) argued it is possible to create a new community and new conversation that is necessary when creating new knowledge.

Moreover, Bruffee (1999) expanded this concept of learning as a collaborative process by casting the process of learning as the re-acculturation of the learner. Meaning that in order to fully participate in a community of learners, a student or learner must gain new vocabulary, knowledge and language skills as one continues to participate within the culture of learning. This learning process is, by its very nature, a collab-

orative process (Bruffee). Furthermore, in this re-acculturation process, Bruffee argued that the learner must gain a new vocabulary to participate within the collaborative community. Without the proper vocabulary to express ourselves effectively, he postulated that often we are unable to participate, let alone understand the communities with which we have find ourselves because "our worlds were closed by walls of words" (Bruffee, 1999, p. 6). Thus by distributing knowledge and authority amongst themselves, a group becomes a collaborative community.

Consequently, in defining what collaboration includes, Crook (1996) listed three basic cognitive benefits of peer collaboration: articulation, conflict, and co-construction. Crook noted that peer collaboration causes students to be more explicit in the public declaration of their ideas. When a student states his or her concept, he or she must be clear and concise in opinion and interpretation. A student will inevitably be faced with conflicting interpretations causing conflict to arise. In the resolution of this conflict, students must defend their interpretation and reflect on their stance. Borrowing from Vygotsky (1978), Crook's co-construction is the process of students constructing shared knowledge by sharing and building upon each others' ideas.

### **Collaboration within a Constructivist Approach**

Wulff, Hanor, and Bulik (2000), noted that the instructor can aid the development of collaboration within a constructivist approach by "redistribut[ing] learning control and power by supporting and/or developing interaction-exchange formats, such as synchronous and asynchronous chat sites and display rooms to cultivate social and individual presence" (p. 150). This non-foundational view allows students to learn in a collaborative fashion, rather than with the traditional foundational view in which knowledge is dispensed from the teacher (Bruffee,

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