Chapter 5.2
Collaborative E-Learning Techniques:
Learning Management Systems vs. Multi-User Virtual Environments

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ABSTRACT

This chapter compares the potential of Learning Management Systems (LMSs) and Multi-User Virtual Environments (MUVEs) to facilitate the implementation of traditional face to face collaborative learning techniques in an online environment and discusses the benefits and challenges of an integrated approach. Initially, the chapter focuses on the application of collaborative learning techniques in traditional and computer supported didactical settings. Following this, the practice of utilizing LMSs in the contemporary educational process is analyzed, and the use of MUVEs in order to facilitate collaborative learning at a distance is subsequently presented. Ultimately, the chapter aims to clarify how the fruitful combination of these two technological approaches to the collaborative learning pedagogy can both diminish their weaknesses and amplify their strengths. For this reason, the final section of the chapter focuses on presenting an integrated approach, which merges two open source solutions: the popular LMS Moodle with the promising MUVE OpenSim.

INTRODUCTION

Collaborative learning can generally be defined as learning activities expressly designed for, and carried out by pairs or small interactive groups (Barkley, Cross, & Howell, 2004). Research has demonstrated that learning is most effective when students work in groups, verbalise their thoughts, challenge the ideas of others, and collaborate to achieve group solutions to problems (Lehtinen & Hakkarainen, 2001; Johnson et al., 2002; Shih & Yang, 2008). Moreover, students who work in small groups tend to achieve relatively higher levels of academic outcomes and are more likely to develop the skills needed for a successful career (Joseph & Payne, 2003). Cooperative learning differs from collaborative learning in that, in cooperative learning, the use of groups supports an instructional system that maintains the traditional lines of classroom knowledge and authority (Flannery, 1994).

Taking into consideration the complete spectrum of available learning paradigms (Strijbos, Kirchner, & Martens, 2004) suggested by esteemed pedagogical theorists such as: Watson and Skinner (behaviourism), Bruner (discovery learning), Ausubel (meaningful learning), Piaget (constructivism), Rumelhart (schemata), Schank and Abelson (scripts), Spiro (cognitive flexibility), Bransford (problem-based learning) Brown (situated cognition), Salomon (distributed cognition) and Engestrom (activity theory), one can safely deduce that the practice of collaborative learning is mostly related to the principles of Vygotsky's dialectical/social constructivism.

Social constructivism focuses on an individual's learning that takes place because of their interactions in a group. This is not to be confused with social constructionism, which focuses on the artifacts that are created through the social interactions of a group.

Therefore, social constructivism is a sociological theory of knowledge that applies the general philosophical constructionism into social settings, wherein groups construct knowledge for one another, collaboratively creating a small culture of shared artifacts with shared meanings. The major theme of Vygotsky's theoretical framework is that social interaction plays a fundamental role in the development of cognition (Wertsch, 1985). Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (inter-psychological) and then inside the child (intra-psychological).

The potential for cognitive development depends upon the "zone of proximal development" (ZPD): a level of development attained when children engage in social behavior (Vygotsky, 1962). In other words, the range of skill that can be developed with adult guidance or peer collaboration exceeds what can be attained alone. The idea of ZPD has been useful for understanding mechanisms in collaborative learning. More advanced peers are likely to be operating within one another's proximal zones of development, modelling in the collaborative group, behaviors more advanced than those they could perform as individuals.

With this fundamental theoretical infrastructure in place, the major goal of collaborative learning becomes to support social interaction and encourage the learner's cognitive processes (Ertl, Kopp, & Mandl, 2007). Collaborative arrangements have been found to be superior to both competitive and individualistic structures on a variety of outcome measures, generally showing higher achievement, higher-level reasoning, more frequent generation of new ideas and solutions, and greater transfer of what is learned in one situation to another (Barkley et al., 2004).

From a motivationalist perspective, collaborative incentive structures create a situation in which the only way group members can attain their own personal goals is if all the members of the group are successful. In these conditions, group members must both help their group mates to do whatever helps the group to succeed, and to

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