A Project-Based Learning Approach: Online Group Collaborative Learning

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ABSTRACT

A framework for Online Group Collaborative Learning is illustrated in this paper. The foundation of the framework is based on Piaget’s concepts of assimilation and accommodation and Vygotsky’s theory of social interaction. This paper examines how an online project-based learning approach affected students’ cognitive skills development and motivation, and explored factors leading to successful collaborative projects. The results indicated that, in a project-based online group environment, unique characteristics exist for leadership style and individual role, goal setting and project management, accountability and commitment, peer supportive relationships, individual accomplishment and group accomplishments, and mixed gender and race group preference.

Keywords: collaboration; group project; online learning

INTRODUCTION

The value of collaborative learning is widely recognized because of its positive effects on social, cognitive, and metacognitive development. One advantage of collaborative learning is that it provides students opportunities for self-reflection and joint construction of knowledge, and this environment frequently leads to higher levels of task-related interaction and behavior (Johnson, Johnson, & Stanne, 1986). When students are able to participate in active learning activities, they find learning more pleasurable and satisfying than non-participative events.

Small group dynamics have been studied in educational contexts since the 1970s. Research indicates that small groups facilitate learning as compared to individual learning (Bruffee, 1999; Hamm & Adams,
1992; Johnson et al., 1986) and that peer group work has significant impacts on varied learning outcomes in both face-to-face and online learning environments (Bruffee, 1999; Harasim, 1990; Scardamalia & Bereiter, 1996; Uribe, Klein, & Sullivan, 2003). Although much of cooperative learning research initially focused on face-to-face cooperation at the elementary school level, now it is extending gradually into higher education, which is the focus of this study.

Positive interdependence promotes group cohesion and a heightened sense of belonging to a group, which can be achieved through the task, resources, goals, rewards, roles, or environment (Brush, 1998). Individual accountability refers to the extent to which students are individually accountable for jobs, tasks, or duties, and was introduced to counter the free-rider effect (some students would deliberately not invest any or little effort). Both principles, however, relate to the group dynamics phenomena of group cohesion and social loafing (Du & Havard, 2003) and thus apply to any form of small group learning. Bosworth and Hamilton (1994) proposed a process-oriented design method for online group-based learning that focused on fostering the envisioned group interaction that is thought to enhance learning instead of focusing on the formal product of such interaction. This method tends to be the dominant view in most institutions providing higher education and centers on five elements that directly shape group interaction: learning objectives, task type, level of prestructuring, group size, and the technological tool used.

The need for systematic design of online learning is amplified by some observations that exhibit conflict regarding coordination during group interaction. These observations that suggest conflicts are more likely to occur in asynchronous online settings compared to face-to-face settings, since group members are not present at the same time or place. Also, the lack of presence concerning immediate feedback and face-to-face setting makes asynchronous communication unnatural. Clearly, some support should be designed to help students overcome difficulties in group coordination during asynchronous collaboration.

Group performance effectiveness depends on the group’s use of its alternate opinions and on the handling of increased coordination (Shaw, 1981). Roles, stated functions/duties, or responsibilities that guide individual behavior and regulate intragroup interaction (Hare, 1994) can promote group cohesion and responsibility (Boud, Cohen & Sampson, 1999) and thus can be used to foster positive interdependence and individual accountability (Hedberg, 2003). In addition, roles can stimulate a group member’s awareness of the overall group performance and each member’s contribution. Finally, roles appear to be most relevant when a group pursues a shared goal requiring a certain level of task division, coordination, and integration of individual activities.

Despite the potential benefits of collaborative learning, several studies reveal that collaborative learning does not always lead to the desired outcome. For example, free collaboration does not systematically produce learning (Dillenbourg, 2002), and researchers report large variations in the quality of interaction and learning outcomes (Lehtinen et al., 2000). Other variations may include, but are not limited to, the length of studies, the technology used, differences in research methodology, and the quality of the group processes (Shaw, 1981; Strijbos et al., 2004). Students who have experienced negative online experiences perceived those experiences as weaknesses of online learning. These problems
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