



## Using Technology to Bridge Learning in Groups

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## BRIEF LITERATURE REVIEW

### Résumé

Le présent article propose un bref aperçu de la documentation portant sur des prolongements pratiques de l'usage de la technologie dans le domaine de l'enseignement universitaire. Comment la technologie peut-elle servir à favoriser l'apprentissage coopératif? Ces prolongements pratiques sont fondés sur les résultats d'études empiriques où sont examinées différentes façons de recourir à la technologie pour approfondir les connaissances des étudiants lors du travail de groupe.

**MOTS-CLÉS :** apprentissage collaboratif, groupes de discussion, environnements d'apprentissage collaboratifs internationaux, communication, motivation

### Abstract

This paper presents a brief review of the literature related to some practical implications surrounding how technology can be used in university teaching. How can it be used to enhance collaborative learning? Implications are based on findings from empirical studies examining different ways technology was used to develop student knowledge through group work.

**KEYWORDS :** collaborative learning, online group discussions, computer-supported intentional learning environments, communication, motivation

### Technology as a communication tool to support collaborative learning

“The challenge of discussing technology, learning theory, and education is increased by the fact that all three areas interact with one another” (Cognition and Technology Group at Vanderbilt, 1996, p. 154). Major changes have revitalized these three areas in the past 10-15 years, affecting not only the role of technology in education, but also student learning (e.g. Brandon & Hollingshead, 1999; CTGV, 1996). Currently, telecommunication technologies are gradually becoming more of a major component within a global network, transforming ways in which people live by making available connections to vast amounts of information as well as individuals anywhere on the planet (Reed & Wells, 1997). For example the number of schools connected to the Internet is an increasing trend not only in the United States but globally as well, which as Vrasidas (2002) states, provides more tools and strategies to facilitate learning. The primary goals of education have changed in the past one and a half decades as well.

Perhaps the most important shift involves the assumption that all students need to be prepared to be lifelong learners and therefore, need to learn to think and reason not only on their own (Resnick, 1987) but with others as well. "New college graduates who can collaborate, share skills and knowledge, and communicate their ideas effectively will be more valuable to businesses" (Kruck & Reif, 2001, p. 1).

Researchers have argued that collaborative learning and computer mediated communication technologies are complementary, given that collaborative learning can help structure the online environment and that technology removes many of the barriers to collaborative learning (Alavi, 1994; Harasim, 1991; Hooper, 1992). An example of communication technology that supports collaboration is Computer Supported Intentional Learning Environments (CSILE), an environment designed to provide opportunities for groups of learners to collaboratively build new understandings (Scardamalia, Bereiter, McLean, Swallow, & Woodruff, 1989). Because all students are on a network, they can easily access the database and can collaborate even when they are not in the same place at the same time. Ewing (2000) examined student views of using technology to support learning in a computer-based closed conference facility. Results showed that students placed considerable value on being able to read the contributions of their peers as it helped prepare them for their own response; an added benefit being that the previous feedback was available on a permanent basis they could revisit at their convenience. Jones and Laffey's (2000) work emphasized this method of sharing knowledge as it enhanced learning experiences not only for current students, but for future students as well. Other people's work and ideas were in a central location available to all allowing them to see what had previously been done.

Tao (2000) found that not only did peer feedback help in student understanding, but also the teacher's mediating role. Working in groups provided students with experiences of conflict and co-construction, in turn fostering students' engagement with the tasks. Pre- and post-tests showed that a more active and reflective approach resulted in students being able to sustain longer their understanding of course content.

Research looking at the effects of computer-mediated group conference on group interactions also showed differences in the level of achievement and retention (Stacey, 1999). Stacey did state that perhaps the results could not be directly attributed to the nature of the interaction but it raised issues of the additional value for learning that group conferencing provided – "an electronic place for continual discussion and reflective interaction, not for just communication of information" (p. 27). Not only did students benefit from being able to clarify and share ideas via group communication but also interviews raised the importance of the social-affective aspect to learning. Posting supportive comments and sharing personal anecdotes provided a network of social interaction that underlay the mutual respect and trust needed for a successful collaborative group process, giving students the sense of belonging that fostered motivation to apply themselves in their own learning. The group's role was a 'secure zone', a place where students could practice the new language of the knowledge community.

Cartwright (2000) used asynchronous computer-mediated conferencing to facilitate group discussion in an undergraduate Nursing course. Case-based group work showed evidence of group dynamics in the electronic discussions as students shared resources and experiences with each other. Initial comments however pertained to

frustrations with software and confusion about electronic discussion and mastering the technology.

In their project, English and Yazdani (1999) observed collaborative learning using a Web-based bulletin board to explore the effects on student learning. Their goal was to develop and incorporate a computer-mediated system to enhance team and mentoring skills in a virtual university. Students in this project showed a strong reluctance to participate in the meetings and an overall lack of motivation to use the technology. One reason for this could be the fact that since the students saw each other face-to-face on a regular basis that they saw no value in the electronic communication. Some students also expressed a lack of understanding in the need for this type of support. Nilsen and Inteseffjord (2000) found that students' lack of motivation to use online groupware system collaboration could be more beneficial should they perceive the task as significant.

In a study comparing face-to-face collaboration and asynchronous computer conferencing, Ocker & Yaverbaum (2001) showed an overall satisfaction with the face-to-face collaboration process more than the computer conferencing. Students had more positive perceptions of the discussion quality and although they preferred the face-to-face collaboration, they did realize the need for, and benefit of 'anytime/anyplace' collaboration.

### **Practical implications for university teaching and learning**

In summary, online group discussions allow students to access questions and feedback not only from peers but from instructors as well. Social-affective issues related to learning such as respect

and trust are needed for successful group collaboration. This fosters motivation to not only become a more active and reflective learner but also encourages student confidence needed to practice the 'new language' of the knowledge community, which in turn enhances their understanding. This is not easily reached if students experience too much frustration with technological problems, and have difficulty recognizing the relevance of participating in online discussions.

Salomon (1992) states that "the cultivation of minds which itself requires a mindful engagement in a social process of meaning appropriation, requires that the whole learning environment, not just the computer program or tool, be designed as well as an orchestrated whole; including curriculum, teachers' behaviors, collaborative tasks, mode of peer collaboration, tasks, learning goals" (p. 64). Cartwright (2000) emphasized instructional design issues over 'technological bells and whistles' when developing courses and programs that use computer-mediated teaching/learning strategies.

From a practical standpoint, the learning environment needs to be structured in order to promote collaboration within groups (Ewing, 2000). These groups need to be cultivated in their growth of mutual trust, understanding, respect for others, and honesty. Here, the instructor or facilitator has an important role in order to attain a balance between motivator, mentor, and mediator. Instructors can offer leadership roles in decision-making to students and to inform them of various resources (Murphy & Cifuentes, 2001) that can affect the success or failure of a learning group (English & Yazdani, 1999). Meeting face-to-face if possible, at initial orientation can help establish a sense of group cohesion that can influence the 'social presence' in electronic meetings (Garrison, 1996).

Opportunities should be available for peer interaction and teachers can encourage this by asking for group responses to tasks, but at the same time, individual learners need to have a sense of responsibility and accountability for meaningful learning (Ewing, 2000). Designing computer-based learning is more effective when it personalizes learning experiences. For example, Fernandez and Liu (1999) used a technology-based statistics teaching mode using different online resources but emphasized the use of real-life data and gave students the opportunity to choose a topic of their choice for the project, coupled with authentic hands-on computer activities. This increased enjoyment, hence their motivation and subsequent results in student learning.

Finally, planning to use technology as a tool to support learning involves more than just deciding what technology to use. As Brandon and Hollingshead (1999) suggested, "instructors should evaluate the content of their course before employing collaborative online groups and should select topics that are complex enough to encourage online discussion and the consideration of multiple viewpoints" (p. 117) in other words, pedagogy should drive the use of technology (Cartwright, 2000). ▀

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