The Interaction and Effects of Perceived Cultural Diversity, Group Size, Leadership, and Collaborative Learning Systems: An Experimental Study

John Lim, National University of Singapore, Singapore
Yingqin Zhong, National University of Singapore, Singapore

ABSTRACT

To understand the circumstances under which the use of collaborative learning systems would enhance learning efficiency, a laboratory experiment with a $2 \times 2 \times 2$ factorial design was conducted to investigate the interaction and effects of perceived cultural diversity, group size, and leadership on learners' performances and satisfaction with process. Contrary to an expected negative relationship between perceived cultural diversity and performance, a positive relationship emerged as a result of leadership. Leadership lowered learners' satisfaction with the process in perceived homogeneous groups (as compared to perceived heterogeneous groups) and smaller groups (as compared to larger groups).

Keywords: collaborative learning; computer mediated communication; cultural differences; leadership; national culture; perception

INTRODUCTION

Collaborative learning refers to a learning process in which two or more people work together to create meaning, explore a topic, or improve skills (Harasim, Hiltz, Teles, & Turoff, 1995). This learning method has been promoted to be more effective in achieving meaningful learning over other traditional instructional strategies, because it supports a learner's knowledge construction process by embodying active cooperation and teamwork in problem solving (Alavi, 1994). The promising capability of e-learning and communication technology has opened the door to new opportunities for collaborative learning. Thanks to these technologies, collaborative learning activities are no longer constrained by time or geographical location. Findings of previous studies indicate that technology-enabled collaborative learning yields more desirable outcomes than nontech-
nology-enabled collaborative learning does (Alavi, 1994). Collaborative Learning Systems (CLS) are systems that are implemented to provide computer-supported environments in facilitating collaborative learning. Most of the groupware applications support a discussion database and serve as a systems development platform on which CLS can be built. Cognitive principles are embedded in designing CLS in order to support distributed discussions among learners. These systems enable effective learning related to interactive communication and teamwork to be achieved in addition to more traditional cognitive learning.

Owing to their important potential in facilitating the collaboration and participation process, CLS have received increasing research attention (Alavi & Leidner, 2001). A substantial amount of empirical evidence demonstrates that computer-mediated cooperative learning tends to have positive impacts on the learning process (Salovaara, 2005). A pertinent and intriguing question is under what conditions the use of CLS will enhance learning efficiency, as there can be moderating factors that influence CLS usage. As a consequence of globalization, there is a growing number of institutions worldwide that offer virtual education programs that often incorporate computer-supported collaborative learning activities as part of the programs. Accordingly, the role of cultural diversity becomes enhanced and must be addressed in the CLS context, as there is a growing diversity in the student population in terms of nationality (Feather, 1999). In spite of the advantages brought about by CLS, heterogeneous groups face challenges triggered by members’ perceptions about the cultural diversity. However, very little research has examined the effects caused by cultural diversity from a perceptive aspect in the context of CLS (Daily & Teich, 2001). Furthermore, as indicated by the small group literature, there are potential interaction effects on teamwork efficiency owing to perceived cultural diversity, leadership, and group size (Stephan & Stephan, 2001). This study seeks to gain insights within the context of CLS into the possible interactions among these factors on learning performance and satisfaction with process. The knowledge will provide important practical guidelines for CLS design and usage.

**LITERATURE REVIEW**

**Learning in CLS**

Dennis and Valacich (1999) propose the Theory of Media Synchronicity, which argues that the following five media characteristics can shape communication: immediacy of feedback, symbol variety, parallelism, rehearsability, and reprocessability. The anonymity, text recording, and multiple-access characteristics supported by CLS should result in relatively higher rankings in parallelism, rehearsability, and reprocessability, yet lower rankings in symbol variety and immediacy of feedback, as compared to the traditional face-to-face setting (Dennis & Valacich, 1999). Feather (1999) suggests that individuals prefer learning in the virtual environment if they require more time to think about a question before answering; if they find it hard to speak out in a traditional classroom, albeit possessing contributions; or if they like some degree of anonymity. Anonymity will allow students to freely express themselves and to overcome their inhibitions (Bargh & McKenna, 2004). The computer-supported communication tools in CLS are found to be effective in overcoming the lack of peer interaction in the classroom (Li, 2002). Group members’ comments are recorded as text, and they can be revisited repeatedly; such a feature is expected to enhance learning effectiveness, especially for nonnative speakers (Herring, 1999). Moreover, through embedding concurrent inputs by multiple users, CLS offer a unique opportunity to eliminate production blocking in brainstorming, particularly as group size increases (Valacich, Jessup, Dennis, & Nunamaker, 1992). The results of these features are more evenly distributed participation among members, decreased domination in discussion, and less centralized leadership (Wellman et al., 1996).
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