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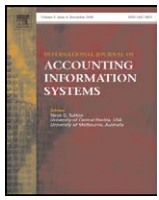

Beyond brainstorming: The effectiveness of computer-mediated communication for convergence and negotiation tasks

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ABSTRACT

Although a considerable body of research in information systems has established that computer-mediated communication (CMC) is beneficial for brainstorming (idea generation) tasks, less is known about its effectiveness for more complex decision-making tasks. This paper reports the results of two experiments comparing the performance of face-to-face and CMC teams in decision-making tasks that move beyond brainstorming. In the first experiment, the performance of face-to-face and computer-mediated teams was compared in two tasks: one requiring participants to engage in convergent thinking and a second brainstorming task requiring divergent thinking. Consistent with predictions derived from McGrath's task circumplex model, the results of experiment one reveal that participants using computer-mediated communication perform significantly better than those interacting face-to-face on the divergent (brainstorming) task. On the convergent task, computer-mediated and face-to-face teams performed equally well; i.e., there was not a significant difference in their performance. In the second experiment, the performance of face-to-face and computer-mediated teams was again compared in two tasks: an integrative negotiation task and an idea-generation task. The results of the second experiment were similar to those of experiment one, in that computer-mediated teams significantly outperformed face-to-face teams in the idea-generation task, while computer-mediated and face-to-face teams performed equally well on the integrative negotiation task. These experiments contribute to the literature by shedding additional light on the conditions under which computer-mediated communication is as effective as, and in some cases more effective than, face-to-face interaction.

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1. Introduction

Increasingly, organizational team work is being facilitated by computer-mediated communication (CMC) and its variants—group support systems, decision support systems, negotiation support systems (NSS), and other electronic meeting systems. These systems enable teams of knowledge workers to collaborate outside the boundaries of time and distance to identify, discuss, and resolve problems. There has been much ongoing research on the subject of CMC and the conditions under which these systems improve decision-making performance relative to traditional face-to-face group work. Over the two decades, research in information systems has established that for brainstorming tasks groups using CMC can outperform groups meeting face-to-face along several qualitative and quantitative dimensions (Connolly et al., 1990; Gallupe et al., 1991, 1992; Valacich et al., 1993, 1994; Dennis et al., 1997/98).

It should be noted that virtually all of the electronic brainstorming research follows Osborn's (1963) rules that encourage divergent thinking. In essence, participants are told "the wilder the idea, the better" based on the assumption that such divergent thinking fosters more creative ideas. It is also noteworthy that the tasks employed in the prior electronic brainstorming research tended to be generic tasks that did not require any specialized knowledge.[2] Thus, while there is a considerable body of research on the efficacy of CMC for generic brainstorming tasks that involve divergent thinking, less is known about the utility of CMC for a range of organizational tasks involving convergent thinking, conflict resolution, or negotiation.

Although some group tasks in business domains settings require divergent thinking, there are a host of organizational group decision-making settings where participants must engage in *convergent* thinking aimed at finding a consensus solution to a problem. A few studies have explored the effects of CMC on various aspects of decision-making behavior where task-specific knowledge is required. In the accounting and auditing domains a number of studies have generally found superior outcomes for computer-mediated teams relative to face-to-face teams (Kerr and Murthy, 1994; Bamber et al., 1996; Karan et al., 1996; Arnold et al., 2000; Murthy and Kerr, 2004). In the context of a new product development project continuation decision, Schmidt et al. (2001) found that computer-mediated teams made the most effective decisions relative to face-to-face teams or individuals working alone.

Moving from problem-solving tasks to those involving conflict resolution and negotiation, even less is known about the effects of CMC. In such tasks, the interacting parties often have opposing goals requiring them to engage in conflict resolution. Negotiation support systems (NSS) are becoming more common with the widespread use of web-based systems in business (Foroughi, 1998; Kersten and Noronha, 1999). The InterNeg Group offers web-based NSS for both training purposes and live negotiations (see http://interneg.carleton.ca). Relative to face-to-face negotiations, NSS represent a viable lower-cost alternative when negotiators are geographically separated. Moving beyond simply proving that NSS can work, however, there is a great need for research into how and under what circumstances negotiation processes can be enhanced by NSS support (Foroughi, 1998).

Why might the effects of CMC differ for tasks that require more than just divergent thinking? Relative to face-to-face communication, CMC has certain process gains, most notably the ability for each team member to input his/her ideas immediately in parallel with other team members. This parallel communication feature has the potential to enhance performance on divergent-thinking tasks such as brainstorming. However, chat-based CMC also has several process losses relative to face-to-face interaction, such as lack of real-time feedback from others in the team, and the possible lack of sufficient attention paid to each team member's ideas as members become preoccupied entering their own comments. While these process losses are not likely to hinder teams performing divergent tasks, they are more likely to hinder teams performing convergent and negotiation tasks that benefit from immediate feedback and call for each team member's comments to be carefully attended to and considered by the other members.

There are theoretical arguments in support of the notion that the communication needs of tasks involving convergent thinking and conflict resolution differ relative to simpler divergent-thinking tasks. McGrath (1984) proposes a "task circumplex" comprised of a series of tasks arranged in increasing order of the "information richness" requirements for successful task completion, where information richness is a communication medium's capacity to convey information (both verbal and non-verbal information) and

[2] Examples of tasks employed include generating ideas for how the parking problem on campus could be resolved, how tourism could be improved in the participants' city of residence, uses for an extra thumb, etc.

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