ABSTRACT

Computer-based systems have been widely applied to support group-related activities such as collaborative learning and training. The various terms accorded to this research stream include virtual teams, e-collaboration, computer-supported collaborative work, distributed work, electronic meetings, and so forth. A notable and well-accepted aspect in the information system field is group support systems (GSS), the focus of this chapter. The numerous GSS studies have reported findings which may not be altogether consistent. An overall picture is much in want which attends to the synthesizing of the findings accumulated over decades. This chapter presents a meta-analysis study aimed at gaining a general understanding of GSS effects. We investigate 6 important moderators in GSS experimental research: group outcomes, namely group size, task type, anonymity, time and proximity, level of technology, and the existence of facilitation. The results point to important conclusions about the phenomenon of interest; in particular, their implications vis-à-vis computer-supported collaborative learning technologies and use are discussed and highlighted along each dimension of the studied variables.
INTRODUCTION

Team-based or group work and collaborations are an integral part of education and learning environments. With the advance of information communication technologies, there has been a growing potential for utilizing computerized systems to support idea generation, project assignment, and instant communication among the IT-age students and educators. The phenomenon has attracted interest from the fields of education as well as Information Systems (IS). In this connection, an emerging area in the instructional technology field called computer-supported collaborative learning (CSCL) has focused on the ways to support group learning using different forms of technologies; some examples are electronic discussion environments, distance learning systems, and intelligent agents (Koschmann, 1996; Strijbos et al., 2003; Ready et al., 2004; Bosco, 2007).

Group Support Systems (GSS) research has accumulated a substantial body of knowledge on the effects of computer-based systems in supporting group work in relation to a variety of tasks such as idea generation and decision making. Based on the successful use of GSS technology to support groups in non-academic settings, researchers have begun to explore ways to apply GSS technology in classroom to support and enhance group-based learning (Tyran & Shepherd, 2001). GSS are used in a classroom setting or distance learning groups to support and structure group communication and learning activities (Leidner & Jarvenpaa, 1995; Sawyer et al., 2001; Alavi et al., 2002; Gill, 2006).

While much work has been done in examining the impacts of GSS on group outcomes, the findings are not altogether consistent. Several early meta-analyses exist (Benbasat & Lim, 1993; McLeod, 1992; Shaw, 1998). Other reviews involve tabular methods which are unavoidably less rigorous (Fjermestad & Hiltz, 1999). Tyran and Shepherd (2001) presented a GSS research framework for analyzing the impact of collaborative technology on group learning, by referring to an earlier framework concerning electronic meeting systems on group processes and outcomes (Pinsonneault & Kraemer, 1990). Nevertheless, as the framework is built based on face-to-face or “same time, same place” research studies (Leidner & Jarvenpaa, 1995), it is somewhat limited in its applicability to group work or learning in other forms such as distributed work or web-based distance learning. Dennis and Wixom (2002) examined five moderators (task, GSS tools, type of group, group size, and facilitation) and their potential effects on GSS use. The necessity has been noted to look deeper than and beyond “the overall effects of GSS use” (p. 236, Dennis and Wixom, 2002). A pertinent question is under what conditions collaborative technology use would improve group performance because there are moderators that influence the specific effects of GSS (Dennis & Wixom, 2002; Beauclair, 1989).

The current study looks into how key moderators individually and jointly influence important group work outcomes using a meta-analytic technique to help derive meaningful conclusions backed by quantitative analysis, as well as provide insights useful for both CSCL and GSS areas. Specifically, our primary interest concerns the use of GSS technology and research in the learning environment. Correspondingly, the paper focuses on six important moderators which are pertinent to both organizational and educational contexts: they are group size, task type, anonymity, time and proximity, level of technology, and the existence of facilitation. A research model is constructed and hypotheses are developed concerning the impacts of GSS. Next, we present a meta-analysis on thirty-three quantitative experimental studies to gain a synthesized view of the GSS effectiveness. The subsequent sections dwell on the results and discussions relating to each of the outcome variables. We conclude the paper by pointing out the relevance to, and implications for, computer-