Improving productivity and creativity in online groups through social comparison process: New evidence for asynchronous electronic brainstorming

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Abstract

This article extends the findings in synchronous room-based electronic brainstorming about the impact of social comparison process on productivity and creativity in a web-based context of asynchronous electronic brainstorming. Social comparison was manipulated with a feedback informing group members of their respective contributions on the electronic brainstorming task through a shared table regularly updated by a facilitator. In another group, although participants had the possibility to identify each contribution within the newsgroup, they did not receive any feedback in a shared table. Results showed that both group productivity and group creativity are better in the social comparison feedback condition than in the other condition. It appears that social comparison process has a positive impact on productivity and creativity in a web-based context of asynchronous electronic brainstorming, but only when participants have access to a shared table facilitating the comparison among group members. This finding provides some useful recommendations for learning facilitators to improve productivity and creativity in the context of computer-supported collaborative learning over the Internet. It also invites to future innovative technological developments to improve participation in online groups.
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1. Introduction

The use of computers and communication systems as support for human cooperative work dates back to the early 1980s (e.g., Huber, 1980). From that date, new forms of computer technology – called Group Support Systems (GSS) – have increasingly developed. Such systems, often called *groupware*, are defined as computer-based network systems which support group work on a common task and provide a shared interface for participating groups (see Ellis, Gibbs, & Rein, 1991). DeSanctis and Gallupe (1987) defined GSS as combining "*communication*, *computer*, *and decision technologies to support problem formulation and solution in group meetings*" (p. 589). These systems were initially developed for commercial use, usually to support decision making processes in organization. They have been widely used for research on electronic brainstorming in groups in which participants generate ideas on computers (see Fjermestad & Hiltz, 1998, for a review). A large majority of studies examined electronic brainstorming in a synchronous room-based context, although the development of Internet has provided over the last years a web-based context without space nor time constraints for testing new forms of electronic brainstorming. The present study does not only extend electronic brainstorming research, shifting from synchronous room-based context to an asynchronous web-based one, but also provides a new test for the impact of social comparison process on productivity and creativity in on-line groups during an asynchronous electronic brainstorming.

1.1. Room-based studies

With electronic GSS, group members communicate by exchanging typed messages, instead of verbally speaking in a meeting room (e.g., Nunamaker, Dennis, Valacich, Vogel, & Georges, 1991). Numerous laboratory and field studies have used GSS to facilitate different types of work and learning methods in different tasks such as communication, planning, voting, negotiation, decision-making, problem-solving, idea generation, and so on. These tasks can be accomplished by using specific instruments such as electronic brainstorming, idea organization, vote, and group writing. GSS's have been essentially used for electronic brainstorming in groups [1] and have proven useful in improving group performance, particularly for creativity tasks such as idea generation (e.g., Gallupe, Bastianutti, & Cooper, 1991; Nunamaker, Applegate, & Konsyski, 1987; Pinsonneault, Barki, Gallupe, & Hoppen, 1999). This form of brainstorming consists in groups of various sizes simultaneously and anonymously generating ideas on a specific issue on individual computers located in a same electronic meeting room. Individual computers are connected to a central computer which collects the generated ideas and controls their display on a large screen at the

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[1] Group brainstorming is a popular technique for creative idea generation developed by Osborn (1957). This technique consists in following a set of four rules designed to establish a non-evaluative setting and to enhance the idea generation process: (a) criticism is ruled out, (b) free thinking is welcome, (c) quantity is wanted, and (d) combination and improvement are sought.