Abstract

This chapter describes and empirically tests a specific electronic brainstorming system aimed at stimulating creative and innovative performance of software developers in the context of innovative product design. The system is based on a solo brainstorming method that provides users with external stimuli and exposes them to a large number of inputs over a short period of time. An empirical test was conducted using 45 volunteer student subjects. It reveals a beneficial effect of the system on the participants’ ability to produce the requirements model for a new software product. In particular, interaction with the system resulted in a significant increase in the total number of ideas generated by the participants, but within similar categories of ideas. The findings suggest that the system may be useful in facilitating performance in working contexts involving creative thinking and problem solving.

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Introduction

There is a widespread recognition in business literature that creativity and innovation are major sources of the economic growth and competitive advantage of today's organisations (Drucker, 1985; Satzinger, Garfield, & Nagasundaram, 1999; Tomas, 1999). It is, therefore, not surprising that surveys show that these two issues are among the top priorities for senior executives in industry today (BW, 1998). There is also an acknowledgement that software has emerged as central to all sophisticated innovations (Quinn, Baruch, & Zien, 1997). In many cases, software is the end product itself, or it is the highest value component in the end product. This is true for most of the fastest growing industries including IT, entertainment, communications, advertising, logistics, and financial services. In other cases, software facilitates most stages of value creation and innovation processes.

The changing economic landscape, particularly the growing importance of software-based innovations, suggests the need for better management of the professional knowledge of software developers. There is a growing need to develop relevant creative and innovative capabilities to enable these employees to work more productively and contribute to economic growth. The purpose of this study is to address the issue of creativity and innovation by describing and testing a specific computer-based system aimed at stimulating the creative thinking and idea generation of software developers represented by students of software courses.

Creativity can be defined as the production of novel and appropriate ideas, solutions, and work processes (Shalley & Perry-Smith, 2001). While newness and novelty are the key dimensions of creative expressions, appropriateness is also an essential requirement in the context of problem solving and innovation. Generally, the education sector should nurture creativity, so that students can be successful in their future roles as innovative professionals and business people. More specifically, it is of utmost importance that informatics students be given an opportunity to develop and apply creative and innovative skills to software processes and products.

Some theorists believe that creativity is reserved only for the gifted, while others see it as a skill that can be learned (Ford, 1996; Marakas, 1998). The author of this book sees creativity as a property of a thought process that can be acquired through instruction and practice. A variety of factors have been suggested to influence creative thinking. Handzic and Cule (2002) grouped them into two broad categories: social and technological. The focus here is on information technology. The role of technology is seen primarily in terms of facilitating the creative process, including generation, exploration, communication, and dissemination of ideas (Shneiderman, 2000; Sridhar, 2001).

The main objectives of this study are to (1) describe a specific electronic brainstorming system based on a solo brainstorming method as a potentially suitable tool for stimulating software developers’ creative thinking and idea generation, and (2)
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