Can Multimedia Learning Tools Enhance Creative Thinking?

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Abstract
The increasing demand for creativity in all domains of study has made this unique construct a surviving means for individuals (Amabile, 1998) and organizations (Dhillon, 2006) which prompts the effort to prioritize creativity development and research particularly in the educational context. Moreover, technological advancement has blessed educational practitioners with the emergence of new teaching and learning tools and approaches. Transforming static learning materials into multimedia forms is an advantage of the technology which has been proven to be effective in enhancing learners' knowledge construction and understanding (Mayer, 2009). The question is whether multimedia learning tools (MLT) could further help learners in their cognitive process and think creatively. Hence, two studies were conducted to test the impact of MLT on mechanical engineering students' creative thinking. MLT on a specific subject were designed and developed, and used by the students at an engineering-based university in Malaysia. The first experiment was a one-group pretest-posttest non-randomized design involving 27 students, and the second experiment was a quasi-experimental two-group pretest posttest non-randomized design involving 64 students. The exposure to the MLT was the treatment condition. Participants' creative thinking was measured using the Torrance Tests of Creative Thinking (TTCT), Verbal forms. Paired-samples t-test results of the first experiment showed significant differences in all elements of students' creative thinking. The results of the TTCT for the second experiment were analyzed using ANCOVA and simple linear regression. The ANCOVA results did not yield significant results. However, the regression analysis was able to predict that the variation in the creative thinking tests was higher when participants were exposed to the MLT. Most responses from the students' interviews also indicated that the MLT have positively influenced their creative thinking. Therefore, this study has shown that there is positive impact on mechanical engineering students' creative thinking when they are exposed to the use of MLT.

Keywords: Multimedia Learning, Creative Thinking

Introduction

Computer-based multimedia learning tools (henceforth, MLT) are able to combine pictorial and descriptive representations of information as well as its dynamic representation (Mayer, 2009). These different representations of information can be effectively utilised in the design and development of MLT to accommodate human cognitive architecture. Studies of multimedia learning have considered information representations and human cognitive architecture so that meaningful learning can occur. Learning from MLT can result in information memorisation, information acquisition or ultimately knowledge construction. Knowledge construction can only be achieved once information presented through the MLT can be applied in a new situation, or when integrated with previous knowledge can produce novel ideas. This is when knowledge is constructed, and meaningful learning occurs. It is therefore the aim of this study to examine the effectiveness of using the MLT in helping students to produce novel ideas, or think creatively.