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Title	Metacognitive-Creative Problem Solving Method: Effects on Students' Metacognition, Creativity, Conceptual Understanding and Performance in Physics
Year	2017
Program	Doctor of Philosophy in Education (Physics)

ABSTRACT

The purpose of this study was to determine the effects of the Metacognitive-Creative Problem-Solving Method (MCPSM) on metacognition, creative thinking skills, conceptual understanding and problem-solving performance in Physics of Grade 9 students using a quasi-experimental and pretest-posttest two group research design. Metacognition was measured using a modified Metacognitive Awareness Inventory (Schraw & Denisson, 1994) while researcher-made scoring rubrics rated creative thinking skills and problem-solving performance of students. A researcher-made multiple-choice test assessed conceptual understanding.

The significant difference in the composite mean ratings in metacognition and creative thinking of the metacognitive-creative problem-solving group and the conventional group was determined using one-way MANOVA. The same procedure was used in determining significant difference in the composite mean ratings in conceptual understanding and problem-solving performance of the two groups of students. Multiple regression analysis determined significant predictors of conceptual understanding from among the dimensions of metacognition and creative thinking. The same analysis was performed to determine significant predictors of problem-solving performance from among the dimensions of metacognition, creative thinking and conceptual understanding.

Metacognitive-Creative Problem-Solving Method (MCPSM) was effective in improving metacognition and creative thinking of students. It was also effective in improving joint conceptual understanding and problem-solving performance in Physics.

Flexibility was a significant predictor of the dimension avoidance of misconception. Metacognitive knowledge and cognitive control have no significant relationship with conceptual understanding because students tended to be selective in their learning of concepts and dwelt only on those needed to solve problems.

Declarative knowledge was a significant predictor of engaging in the problem and executing mathematical operation while planning as a dimension of cognitive control was associated to execution of the mathematical operation. Elaboration and fluency were both related to applying concept, planning solution and formulating equation. Checking solution was influenced by both elaboration and flexibility while originality influenced applying concept and planning solution. Likewise, avoidance of misconception was found to have positive relationship with applying concept, planning solution, formulating equation and executing a mathematical operation. Analyzing concept also influenced planning solution.

The Metacognitive-Creative Problem-Solving Method is recommended for classroom instruction to facilitate the learning of problem-solving skills particularly, in solving multi-step problems. It is also recommended to include Metacognitive-Creative Problem Solving Method in preparing future teachers and for in-service trainings. Future studies can also be conducted on determining the strengths and weaknesses of metacognitive-creative problem-solving in Physics and the types of students and learning areas where this teaching and learning strategy works best.