The Mediating Effects of Critical Thinking Skills on Motivation Factors for Mathematical Reasoning Ability

Abstract

This study aims at investigating the direct effects of three motivation factors, self-efficacy, task value, and mastery goal orientation, and a deep cognitive strategy, critical thinking skills on students’ mathematical reasoning ability. Besides, the study focuses on the examination of the mediating effects of critical thinking skills on the motivation factors for students’ reasoning abilities. Data were collected from 212 eleventh-grade high school students. The study used the partial least squares-based structural equation modeling to test the path relationships. Results revealed that task value and critical thinking skills were the two dominant predictors of students’ performance in mathematical reasoning. Besides, critical thinking skills was fully mediated with the relationship of mastery goal orientation on the students’ abilities to solve the reasoning tasks. A small effect of complementary partial mediation was found for task value on reasoning abilities through use of the critical thinking skills. Self-efficacy was revealed as having no direct effect on the application of critical thinking skills nor performance in mathematical reasoning. Policymakers or educators should take these results into consideration to seize opportunity for students to make sense and think critically in mathematics studies.