ZMATH 2016e.00461

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The relationship between mathematical problem-solving skills and self-regulated learning through homework behaviours, motivation, and metacognition.

Int. J. Math. Educ. Sci. Technol. 47, No. 3, 408-420 (2016).

Summary: Studies highlight that using appropriate strategies during problem solving is important to improve problem-solving skills and draw attention to the fact that using these skills is an important part of students' self-regulated learning ability. Studies on this matter view the self-regulated learning ability as key to improving problem-solving skills. The aim of this study is to investigate the relationship between mathematical problem-solving skills and the three dimensions of self-regulated learning (motivation, metacognition, and behaviour), and whether this relationship is of a predictive nature. The sample of this study consists of 323 students from two public secondary schools in Istanbul. In this study, the mathematics homework behaviour scale was administered to measure students' homework behaviours. For metacognition measurements, the mathematics metacognition skills test for students was administered to measure offline mathematical metacognitive skills, and the metacognitive experience scale was used to measure the online mathematical metacognitive experience. The internal and external motivational scales used in the Programme for International Student Assessment (PISA) test were administered to measure motivation. A hierarchic regression analysis was conducted to determine the relationship between the dependent and independent variables in the study. Based on the findings, a model was formed in which 24% of the total variance in students' mathematical problem-solving skills is explained by the three sub-dimensions of the self-regulated learning model: internal motivation (13%), willingness to do homework (7%), and post-problem retrospective metacognitive experience (4%).

Classification: D53 C43 C33 C23
Keywords: problem solving; self-regulated learning; metacognition; motivation; homework behaviour
doi:10.1080/0020739X.2015.1080313