

## Abstract

Self-regulated learning (SRL) represents a necessary fundamental 21st-century skill for children and adolescents, and is essential for the development of gifted students. This study explored mathematically gifted (MG) junior high school students' SRL capabilities while solving mathematical problems compared to typical achievers (TAs). To date, few studies have compared MG and TA students' use of SRL strategies during mathematical problem-solving. A sample of 71 ninth-grade students from three junior high schools were divided into two study groups (MG and TA). Participants completed Motivated Strategies for Learning Questionnaires (MSLQ) and a Metacognitive Strategy Usage Questionnaire (MSUQ). In addition, students underwent Think-Aloud Interviews while solving mathematical problems (quadratic function) at two levels of difficulty. The results only revealed significant differences between MG and TA students on the organization subscale of the MSLQ questionnaire. No significant differences were found regarding the other three subscales (i.e., critical thinking, metacognitive self-regulation, and time and study environment management). Additionally, no differences were found between the study groups in the metacognitive strategies used questionnaire. MG students outperformed TA students on the mathematical problem-solving test and generally used more SRL strategies during the qualitative think-aloud interviews. Moreover, the between-group differences in effect sizes were higher on the high-level problem-solving task than the low-level difficulty task.

Interesting results were revealed upon examining each study group's use of the three SRL strategies: orientation, systematical orderliness, and evaluation and reflection. The results indicated that for all three types of SRL strategies, the TA students used more strategies while solving low-level mathematical problems than high-level mathematical problems. The results revealed that the MG students who participated in the study implemented fewer orientation strategies when solving high-level of difficulty problems and used similar rates of problem-solving strategies for problems at both levels of difficulty. The study results further demonstrated that the MG students used a similar rate of problem-solving strategies for both levels of difficulty. However, while solving the high-level mathematical problem, they used more evaluation and reflection strategies than the low-level mathematical problem.

In conclusion, the present study's findings constitute a significant milestone in the study of SRL capabilities of mathematically gifted and typical-achieving students in junior high school. The results form the basis for further research in the field, as well as for developing intervention programs intended to promote the efficient use of SRL strategies while solving mathematical problems at various levels of difficulty.