

The purpose of this study was to investigate the effects of metacognitive strategy instruction on the mathematical problem solving of elementary school students with mathematics learning disabilities, and to analyze the influences of the students' problem solving processes. The metacognitive strategy was adapted from cognitive-metacognitive strategies for mathematical problem solving by Montague (1992, 1995, 1997). A multiple-baseline across individuals design was used, which included baseline, treatment, and maintenance phases. The subjects were three fourth- and fifth-grade students with mathematics learning disabilities. The investigator developed a series of mathematical problem solving tests. Each test consisted of three different problem types (i.e., one-step, extraneous information, and two-step). All tests were scored to evaluate students' performance in solving problems. In addition, thinking-aloud and interviews were used to explore students' characteristics of problem solving processes in pre- and post-teaching. The results of this study were as follows: 1. The metacognitive strategy instruction was successful in increasing the scores on the whole, extraneous information, and two-step word problems for the students with learning disabilities, and these results were maintained at 4 weeks follow-up. 2. For the students with learning disabilities, the scores on one-step word problem didn't increase significantly. 3. The metacognitive strategy instruction could decrease the errors in reading and analyzing problems for the students with mathematics learning disabilities, and help them to comprehend problems. 4. After instruction, the mathematical learning disabled students would decrease the use of key-word and guessing strategies. In addition, the instruction would promote the use of comprehending and diagram strategies. 5. After instruction, the students with mathematics learning disabilities would actively check computation and problem-solving steps.