

The thesis focuses on the ways of thinking and acting of students from the Czech and the Slovak Republic, while solving application problems. On the one hand the thesis offers the identification and categorisation of solving strategies of mathematical problems by gifted students. On the other hand, there is an attempt for the insight into students' thinking processes by means of an in-depth analysis of their written work. I focus on the utilisation of students' mathematical knowledge when solving real-life problems, on the extent to which they apply automatic mathematical methods, on students' reactions to mistakes and unsuccessful solving strategies, their grasping of tasks and their discourse. The data is collected by means of students' written solutions to two mathematical problems, a questionnaire, semi-structured interviews with teachers and observations of their lessons. The data has been analysed through grounded theory and the results are compared with particular results of international comparative researches (PISA and TIMSS).