

**Pupils' difficulties in solving selected word problems from TIMSS research.
(Diploma Thesis.)**

Abstract

The theoretical part of the diploma thesis describes international comparative surveys, namely PISA and TIMSS, and analyses results of Czech pupils. Some areas are distinguished in which our pupils were unsuccessful and from them, the area of word problems and their mathematisation was selected for further work. Next, a solving strategy is characterised and some relevant research from this area is given.

The core of the work lies in the experimental part whose goal was to find out what strategies pupils use when solving selected problems from TIMSS research and why they fail in them, via the analysis of pupils' written solutions complemented by interviews with them. Causes of failure of our pupils in these problems in TIMSS 2007 are looked for in mistakes pupils make, while it is also followed in what phase of the solving process they appear.

The participants of research were pupils of Grade 9 of a primary school who solved three selected word problems from TIMSS research. Their written solutions were complemented by interviews with the experimenter focused on their mistakes and lack of clarity of the solutions. Four pupils participated in a pilot study. The atomic analysis of their solutions confirmed suitability of the selected problems, made the organisational side of research more precise and brought about some insight into solving strategies and mistakes of pupils. Twenty-three pupils participated in the main study, solving 2 to 3 problems. The results of the analyses of their solutions consist of the list of strategies they used for the problems and mistakes they made which caused the failure of their solutions. Interesting phenomena which appeared in the solutions are illustrated by concrete works of pupils. The analysis of each problem ends with a summary of phenomena which appeared in its solutions in the four phases of the solving process. It transpired that pupils had problems with attentive reading of the text and with its mathematisation, with the knowledge of the formula for the area of circle, with direct proportion and fractions and per cent. Other problems lie in the fact that many pupils forget about mathematical and semantic check.

Keyword PISA, TIMSS, word problem, mathematisation, solving process of mathematical problems, mistakes.