

# OPEN REAL-WORLD PROBLEMS IN THE PRIMARY CLASSROOM: INVESTIGATING PUPILS' INTERACTIVE MODELLING PROCESSES

Andrea Peter-Koop, University of Oldenburg, Germany

Primary children solving traditional word problems frequently engage in a rather arbitrary and random operational combination of the numbers given in the text. In doing so, they often completely fail to acknowledge the relationship between the given data and 'real world' related context (e.g., see Verschaffel, Greer & de Corte, 2000).

In order to foster and highlight the mathematical modelling process, open real-world problems have been used in a classroom based study aiming to investigate elementary children's mathematical modelling strategies. The following criteria guided the development of the problems used in the research project: the problems should be open-beginning as well as open-ended real-world tasks providing 'reference contexts' for elementary students; the wording of the problems should not contain numbers in order to avoid that the children immediately start calculating without first analysing the context of the given situation and to challenge the students to engage in estimation and rough calculation and/or the collection of relevant data. Overall, four such problems have been posed in grade 3 and grade 4 classes which were subsequently divided into working groups of four to five children. Each group was videotaped while solving the problem.

The methodological framework of the project was based on an 'Interpretative Classroom Research' approach and involves pre-service teachers as 'teacher-researchers' following a strict analytical procedure in the interpretation of the video data obtained in classrooms.

The interpretative analyses of the group work episodes indicate that the children do not develop and then execute a *solution plan* as for example suggested by Polya (1973) and others. While most groups—including the low achievers—were generally highly successful in finding an appropriate solution, the mathematical modelling process leading to that solution was determined by a slowly developing process in which hypotheses were generated, tested, confirmed or neglected while arithmetic results were interpreted, leading to the development of further solution ideas. The poster portrays and contrasts the modelling processes of different groups and introduces a 'model' of children's modelling processes.

## References

- Polya, G. (1973). *How to solve it: A new aspect of mathematical method*. Princeton, NJ: Princeton University Press.
- Verschaffel, L., Greer, B. & De Corte, E. (2000). *Making sense of word problems*. Lisse, Netherlands: Swets & Zeitlinger.