

THE CONSTRUCTION OF A DIAGNOSTIC TOOL FOR “ADDITION” AND “SUBTRACTION”: AN EXAMPLE OF RESEARCH SUPPORTING PRACTICE

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“Addition” and “subtraction” are key concepts in Mathematics. Children begin to study them from as early as pre-school and work with them throughout their primary school years. It is, therefore, imperative for teaching practitioners to be able to diagnose the quality of their pupils’ understanding and plan their instruction accordingly (Carpenter et al., 1988).

The study reported here aspired to fill a significant gap in the related literature with the construction of a comprehensive diagnostic instrument for addition and subtraction. The basis for its design was the classic categorization of additive word problems by Carpenter et al. (1983) according to their semantic structure (“change”, “combine”, “compare” and “equalize” problems with each category including “join” or “separate” types). The result was an 18-item instrument which represented all the possible cases of semantic categorization. For example, the problem “Peter had 6 apples. Anna gave him 9 more apples. How many apples does Peter have now?” was a “change-join-final quantity unknown” case.

The instrument was administered to a convenience sample of 121 (7- and 8-year-old) pupils and 4 of them were interviewed in depth about their scripts. The test data and, more importantly, the interview data indicate the diagnostic strength of the proposed tool: all the conceptions and misconceptions mentioned in the literature were revealed through the problem solutions and the children’s explanations for them. As a result, the use of such an instrument can effectively aid and enrich the teachers’ diagnostic competence, empowering them in terms of their teaching practice.

Acknowledgement

The authors would like to thank Professor Lieven Verschaffel for his valuable help during the design stage of the study.

References

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