ZMATH 2012c.00437

Nunes, Terezinha; Bryant, Peter; Evans, Deborah; Bell, Daniel; Barros, Rossana

Teaching children how to include the inversion principle in their reasoning about quantitative relations.

Educ. Stud. Math. 79, No. 3, 371-388 (2012).

Summary: The basis of this intervention study is a distinction between numerical calculus and relational calculus. The former refers to numerical calculations and the latter to the analysis of the quantitative relations in mathematical problems. The inverse relation between addition and subtraction is relevant to both kinds of calculus, but so far research on improving children's understanding and use of the principle of inversion through interventions has only been applied to the solving of $a + b - b =?$ sums. The main aim of the intervention described in this article was to study the effects of teaching children about the explicit use of inversion as part of the relational calculus needed to solve inverse addition and subtraction problems using a calculator. The study showed that children taught about relational calculus differed significantly from those who were taught numerical procedures, and also that effects of the intervention were stronger when children were taught about relational calculus with mixtures of indirect and direct word problems than when these two types of problem were given to them in separate blocks.

Classification: F32 D52 D42
Keywords: inverse relation between addition and subtraction; relational calculations; numerical calculations; word problems; teaching the inverse relation; primary education
doi:10.1007/s10649-011-9314-5