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Flexible use and understanding of place value via traditional and digital tools.

Liljedahl, Peter (ed.) et al., Proceedings of the 38th conference of the International Group for the Psychology of Mathematics Education “Mathematics education at the edge”, PME 38 held jointly with the 36th conference of PME-NA, Vancouver, Canada, July 15–20, 2014, Vol. 4. [s. 1.]: International Group for the Psychology of Mathematics Education (ISBN 978-0-86491-360-9/set; 978-0-86491-364-7/v.4). 33-40 (2014).

Summary: Place value is a key concept for numbers that is introduced in early mathematics. It is necessary to have a flexible understanding of place value for efficient arithmetic strategies and success in written algorithmic arithmetic. In our research we explore typical mistakes and misconceptions that occur with 3rd graders in German elementary school and investigate the various underlying actions when manipulating numbers in a place value chart. We also report on a follow-up quantitative study that compares real and virtual manipulatives for place value and their effect on learning of place value.

Classification: F32 U62 U72 D72

Keywords: place value; traditional tools; digital tools; arithmetic strategies; written arithmetic; misconceptions; errors; virtual manipulatives; real manipulatives