Learning paths and learning supports for conceptual addition and subtraction in the US common core state standards and in the Chinese standards.


Summary: The results of the authors [ZDM, Int. J. Math. Educ. 41, No. 6, 793–808 (2009; ME 2009f.00199)] analysis of the major early numerical aspects and learning supports for single-digit and multi-digit adding and subtracting in a representative Chinese textbook series and a US textbook series (Math expressions) are related to the Chinese standards and to the US common core state standards for these topics. Similar learning paths and visual-quantitative supports for mathematical thinking were identified in the textbooks from both countries, the US standards, and the experimental Chinese standards (2001). The new Chinese standards (2011) were less specific about learning paths and supports, though these appeared in examples. Criteria for judging the best variations of the multi-digit adding and subtracting variations were proposed and used. This analysis identified the best variations as the “new groups below” for adding and the “ungroup first” for subtracting. The somewhat different levels in the adding and subtracting learning paths for East Asia and the US are summarized.

Classification: B70 D30 U20 D40 F30

Keywords: addition; subtraction; language effects; learning supports; cross-cultural textbook analysis; standards

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