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Middle school students' understanding of core algebraic concepts: equivalence & variable.

Cai, Jinfa (ed.) et al., Early algebraization. A global dialogue from multiple perspectives. Berlin: Springer (ISBN 978-3-642-17734-7/hbk; 978-3-642-17735-4/ebook). Advances in Mathematics Education, 259-276 (2011).

Summary: Algebra is a focal point of reform efforts in mathematics education, with many mathematics educators advocating that algebraic reasoning should be integrated at all grade levels K-12. Recent research has begun to investigate algebra reform in the context of elementary school (grades K-5) mathematics, focusing in particular on the development of algebraic reasoning. Yet, to date, little research has focused on the development of algebraic reasoning in middle school (grades 6-8). This article focuses on middle school students' understanding of two core algebraic ideas-equivalence and variable-and the relationship of their understanding to performance on problems that require use of these two ideas. The data suggest that students' understanding of these core ideas influences their success in solving problems, the strategies they use in their solution processes, and the justifications they provide for their solutions. Implications for instruction and curricular design are discussed. [This chapter is a reprint of an article published in ZDM-International Reviews on Mathematical Education, 37(2005)1), p. 68-76, ME 2009b.00392].

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