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Can mathematical problem solving be taught? Preliminary answers from 30 years of research.

Felmer, Patricio (ed.) et al., Posing and solving mathematical problems. Advances and new perspectives. Cham: Springer (ISBN 978-3-319-28021-9/hbk; 978-3-319-28023-3/ebook). Research in Mathematics Education, 117-135 (2016).

Summary: In this chapter, the authors note that during the past 30 years there have been significant advances in our understanding of the affective, cognitive, and metacognitive aspects of problem solving in mathematics and there also has been considerable research on teaching mathematical problem solving in classrooms. However, the authors point out that there remain far more questions than answers about this complex form of activity. The chapter is organized around six questions: (1) Should problem solving be taught as a separate topic in the mathematics curriculum or should it be integrated throughout the curriculum? (2) Doesn't teaching mathematics through problem require more time than more traditional approaches? (3) What kinds of instructional activities should be used in teaching through problems? (4) How can teachers orchestrate pedagogically sound, problem solving in the classroom? (5) How can productive beliefs toward mathematical problem solving be nurtured? (6) Will students sacrifice basic skills if they are taught mathematics through problem solving?

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