

ZMATH 2016f.01093

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‘Can’t you just tell us the rule?’ Teaching procedures relationally.

Pope, Sue (ed.), Proceedings of the British Society for Research into Learning Mathematics (BSRLM). Proceedings of the British congress of mathematics education, BCME-8, University of Nottingham, UK, April 14–17, 2014. London: British Society for Research into Learning Mathematics (BSRLM). 151-158 (2014).

Summary: It is now almost 40 years since Skemp’s seminal division of understanding into ‘instrumental’ and ‘relational’ categories, yet the current political direction of mathematics education in the UK is decidedly towards the traditional teaching of ‘standard algorithms’. In this research paper, I draw on a lively staffroom discussion about different approaches to the teaching of quadratic equations, in which one method used was derided as ‘a trick’. From this, I discuss reasons why certain mathematical processes are often regarded as inherently and irretrievably ‘procedural’. Informed by recent theoretical interpretations of procedural and conceptual learning in mathematics, which increasingly stress their intertwining and iterative relationship, I make a case that stigmatising particular methods and censoring their use may deny students valuable opportunities to make sense of mathematics. I argue instead that encouraging students to take a critical stance regarding the details and the value of the procedures that they encounter can cultivate in them a deeper awareness of mathematical connections and a more empowered sense of ownership over their mathematics.

Classification: H30 C30 D30

Keywords: quadratic equations; teaching; mathematical procedures; potential value and dangers; discussion; staffroom conversation; standard algorithms; solving equations; conceptual knowledge; instrumental understanding; procedural knowledge; relational understanding; student autonomy
<http://www.bsrlm.org.uk/BCME8/BCME8-20.pdf>