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The role of sample pupil responses in problem-solving lessons: perspectives from a design researcher and two teachers.

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). 135-142 (2014).

Summary: The benefits of learning mathematics by comparing, reflecting on and discussing multiple approaches to a problem are well-known. However, teachers using non-routine problem-solving tasks designed to encourage multiple approaches face challenges: understanding how pupils make sense of the problem, especially when pupils use unique or unanticipated approaches and helping pupils make connections between disparate approaches and aligning these with lesson goals. In an attempt to address such challenges an extensive set of problem solving lessons were developed. Each lesson includes a range of sample solution-methods that expose pupils to multiple perspectives. A detailed teacher guide supports each lesson. This paper focuses on the use of these sample solution-methods. It explores their development from initial design to final versions. We analyse the varied interpretations and use made of sample solution-methods, in both US classrooms and by two UK teachers, and reflect on how these interpretations align with the designers' intention.

Classification: D50

Keywords: problem solving; non-routine problems; problem-solving strategies; multiple solutions; multiple approaches; formative assessment; sample pupil responses; lesson planning; educational research; design research

<http://www.bsrlm.org.uk/BCME8/BCME8-18.pdf>