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A randomized trial of lesson study with mathematical resource kits: analysis of impact on teachers' beliefs and learning community.

Middleton, James A. (ed.) et al., Large-scale studies in mathematics education. Cham: Springer (ISBN 978-3-319-07715-4/hbk; 978-3-319-07716-1/ebook). Research in Mathematics Education, 133-158 (2015).

Summary: We report on a randomized, controlled trial of an intervention that had a significant impact on teachers' and students' mathematical knowledge: lesson study supported by mathematical resource kits. In lesson study, teachers engage in collaborative study-plan-act-reflect cycles centered around classroom research lessons. This report focuses on outcomes related to teachers' beliefs and learning community, potentially important mediators of teachers' continued effort to improve instruction. Groups of 4–9 educators (87 % elementary teachers) were randomly assigned to the intervention (lesson study with fractions resource kit) or one of two control conditions; resource kits were mailed out to groups, who locally managed their lesson study in scattered locations across the USA. HLM analyses indicate that the intervention significantly increased two of the six measures of teachers' beliefs and teacher learning community – Expectations for Student Achievement and Collegial Learning Effectiveness. When examined as mediators of knowledge change in the overall sample, increases in Collegial Learning Effectiveness and Professional Community both significantly predicted teachers' gain in fractions knowledge and increase in teachers' collegial learning effectiveness significantly predicted students' gain in fractions knowledge. Findings suggest the power of lesson study supported by mathematical resources to impact teachers' beliefs likely to support teachers' continued learning from practice over time. Findings also suggest the potential of scale-up strategies that couple high-quality mathematical resources with practice-based learning strategies such as lesson study, as a solution to the conundrum of faithful implementation of high-quality materials versus teacher “ownership” of professional learning.

Classification: C79 C69 C29 D39 F40 D20

Keywords: lesson study; teacher learning; professional development; fractions; mathematics learning; teachers' beliefs; teacher community
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