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Changing pre-service elementary teachers' beliefs about mathematical knowledge.

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Summary: Studies have reported that pre-service teachers often enter teacher preparation programs with beliefs and attitudes not conducive to teaching the subject conceptually. In the USA, the Common Core State Standards for Mathematics have brought a renewed focus on procedural and conceptual understanding. However, many U.S. pre-service teachers have developed a procedural focus from their own schooling experience. This study investigated the effect of a mathematics and pedagogy course focused on conceptual understanding on one class of U.S. preservice elementary teachers' beliefs about mathematical knowledge. The course used the Lesh Translation Model [*R. Lesh*, "Mathematical learning disabilities: considerations for identification, diagnosis, and remediation", in: R. Lesh (ed.) et al., Applied mathematical problem solving. Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education. 111–180 (1979)] to build conceptual understanding through multiple representations. While the change in beliefs from the beginning to the end of the course was investigated, this study also specifically investigated the change in beliefs arising from session activities concerning division by fractions. The course combined difficulties that students can have when taught procedurally, shown with example video, and conceptual understanding that students can display when taught with well-structured activities. This proved to be a useful combination for changing pre-service teachers' beliefs by showing the need to learn fraction division differently and then providing conceptual ways to think about this concept.

Classification: C29

Keywords: preservice teachers; teacher attitudes; knowledge level; concept formation; mathematical concepts; teacher beliefs; fractions; teaching styles

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