

Chapter 11

Improving Preservice Teachers' Beliefs and Attitudes About Mathematics and Readiness to Teach Math

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ABSTRACT

This study examined preservice teachers' (PSTs) beliefs and attitudes in the teaching of mathematics at the elementary level. The study was conducted while the PSTs were enrolled in their mathematics methods course and a field-based experience, where they received targeted feedback on their performance. The study utilized a multimethod research design. The quantitative part consisted of analysis of pre- and post-surveys regarding PSTs' beliefs and attitudes toward teaching mathematics and their confidence to teach it. In the qualitative part, PSTs reflected on their experiences by writing to a weekly prompt on a Padlet wall, where they received feedback on their comments and questions. Findings suggest that when PSTs are able to connect theory and pedagogy from their methods course in mathematics to their field-based experience and reflect on their learning and teaching of mathematics, their beliefs and attitudes toward teaching mathematics, and their readiness to teach it improve.

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IMPROVING PRESERVICE TEACHERS' BELIEFS AND ATTITUDES ABOUT MATHEMATICS AND READINESS TO TEACH MATH

As prospective elementary teachers prepare to take their methods courses, they confront the importance of mastering the science, technology, engineering, and mathematics (STEM) disciplines. In a world driven by innovation and scientific inquiry, proficiency in these areas is imperative for success in the elementary teaching profession. Course instructors need to bridge pedagogy and STEM proficiency to prepare a new generation of educators ready to meet the challenges of an ever-changing world.

Often, preservice teachers (PSTs) at the elementary level bring a sense of apprehension when it comes to teaching mathematics in their future classrooms. They perceive themselves as lacking the skills and competence to teach math effectively. PSTs' attitudes and efficacy beliefs toward mathematics can influence how they view the subject and how they will teach it in their future classrooms (Gresham & Burleigh, 2019). Understanding and addressing these concerns may help PSTs to develop confidence and self-efficacy in teaching mathematical skills and concepts.

The authors of this chapter set out to examine elementary PSTs' beliefs and attitudes about mathematics and their readiness to teach math as they approach entering the teaching profession. This chapter will explore the effect of a field-based experience closely connected to a math methods course on the PSTs' beliefs, attitudes, and readiness to teach in this content area. The study also examined the effects of targeted feedback on PSTs' perceptions and performance. By closely examining their own perceptions of math, PSTs can begin to explore how to deepen their understanding of mathematics, overcome anxiety toward the subject, and help their students to make connections to math concepts (Burton, 2012).

CONCEPTUAL FRAMEWORK

Self-Efficacy

To better understand the relationship between PSTs' beliefs and attitudes about their ability to teach mathematics, it is important to understand the construct of Social Cognitive Theory (SCT). Much of the research done in this area is based on Albert Bandura's (1977, 1984, 1986, 1997) theory of self-efficacy. Bandura argued that specific measures of self-efficacy predict levels of subsequent success. People's self-efficacy beliefs determine their level of motivation, reflected in the effort they exert in an endeavor and how long they persevere in the face of obstacles. The

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