

Chapter 4

Embedded Tutoring Experience in a Math Methods Class to Support Equitable Teaching

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ABSTRACT

Teaching is a complex activity that requires making “in-the-moment decisions” based on multiple factors to support learning. Preparing pre-service teachers to make these professional decisions is challenging because teaching is not a matter of following a series of prescribed steps. Rather, the pre-service teacher must draw from various sources of information such as curriculum, standards, assessment, student prior knowledge, and theories of learning to make targeted decisions in real-time to support learning. Even though pre-service teachers may learn about these components of teaching, coordinating this information to make targeted pedagogical decisions is challenging. This chapter explores how hands-on tutoring experiences, involving students embedded within a methods class, can help pre-service teachers bridge the gap between theoretical knowledge and the practical skills needed for effective teaching. It emphasizes the importance of approximating teaching practice and adapting teaching methods to support equitable learning experiences for diverse students.

INTRODUCTION

Rehumanizing mathematics teaching involves getting to know students as individuals, honoring their cultural backgrounds, making students feel valued as human beings, and, most importantly, letting students express their thinking mathematically. Encouraging students to take ownership of their learning is a key aspect of rehumanizing mathematics teaching. It empowers them to see mathematics as meaningful and relevant to their lives (Gutiérrez, 2009). Students need support in learning rigorous mathematics in this way. Gutiérrez (2009) outlines four equity dimensions for supporting the learning of all students:

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access, achievement, identity, and power. Students need access to high-quality instruction; they must view mathematics as relevant and develop an identity as capable of learning mathematics.

Supporting preservice teachers (PSTs) to engage in equitable mathematics teaching using ambitious approaches goes beyond pedagogical skills. PSTs must develop authentic relationships with students and understand them as individuals rather than stereotypes. In other words, equitable teaching considers students' lived experiences (Berry et al., 2020). When the student and the teacher feel emotionally connected, an authentic relationship is more likely to develop. This approach challenges deficit views of mathematical learning (Cahill & Bostic, 2024) and promotes a positive learning environment. Therefore, we explore how individual tutoring experiences can support PSTs to engage in ambitious teaching by helping them develop pedagogical decision-making skills from an equity perspective.

We consider tutoring individual students within a methods class as an approximation of the practice of teaching (Grossman et al., 2009; Mikeska et al., 2019) because it reduces the complexity of teaching (Sapkota & Max, 2023) as the PSTs have to only support the learning of one student instead of an entire class. For example, to support a class of learners, PSTs should develop skills for supporting meaningful mathematics whole group discussions, which requires the advanced skills of orchestrating and synthesizing multiple students' responses. However, tutoring as an approximation of practice teaching experience scaffolds these skills by providing PSTs with opportunities to make in-the-moment decisions (Choppin, 2011) when working with an individual student. They can develop a relationship with a student and make pedagogical decisions based on multiple factors instead of following a set of prescribed procedures.

In this chapter, we explore the benefits of incorporating individual tutoring teaching experiences within a mathematics methods course for PSTs to practice making pedagogical decisions in a low-stakes environment. By doing so, students can combine their explicit and tacit knowledge to make professional decisions to support students in learning mathematics. Furthermore, it provides opportunities for PSTs to connect theory and practice they are learning in their mathematics methods course. First, we explore the art of teaching and the role of explicit and tacit knowledge.

Shoenfeld (2011) aptly compares the 'art of teaching' to cooking. It is not about following a recipe but about using a nuanced understanding to adapt and improve. Similarly, expert teachers use tacit knowledge (Herbst & Kosko, 2014) to make more effective pedagogical decisions. Consider the following scenario: a teacher poses a problem for students to solve, and they appear disengaged. There are multiple ways the teacher can respond. An ineffective teacher might ignore the situation and blame the students for not putting in enough effort. Perhaps the teacher is unaware that the students are disengaged and moves on to the next lesson. An effective teacher might look at the situation from multiple perspectives and decide how to respond so that the teaching moves directly and efficiently supports student learning. This process involves drawing upon the teacher's tacit knowledge, which comprises prior teaching experiences, knowledge, student relationships, and explicit knowledge, to make a professional judgment.

For example, the teacher might judge that the problem context in the textbook did not have meaning or relevance to the students and decide to change the problem context to something they could relate to. The teacher may walk around and notice that the students lack prior knowledge to engage in the problem and, therefore, decide to scaffold the problem. A student was distracting the rest of the class by sharing a funny cat video, and the class was not paying attention to the problem. Therefore, the teacher decides to have the student put away the -phone and redirect the class's attention to the problem.

Teachers could make multiple teaching moves based on how they interpret the situation by considering which factors are most relevant to a given situation. Making professional judgments to support learning involves interpreting a situation, making a targeted action, and preparing PSTs to make professional

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