

## Chapter 2

# Approximations of Practice of Mathematics Language Routines and Multilingual Learner Core Practices: A Focus on a Secondary Mathematics Methods Course

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### ABSTRACT

*The authors explored how preservice secondary mathematics teachers (PSTs) understood and applied mathematics language routines (MLRs) and related core practices during a secondary mathematics methods course focused on effective instruction for multilingual learners. The study involved eight PST participants who engaged in four cycles of learning about and implementing a core practice and focal MLR over the course of nine weeks. They present key findings addressing how PSTs comprehended the approximations of practice related to MLRs and multilingual learner core practices, highlighting both the benefits and limitations of the MLRs. Additionally, they discuss the advantages of using approximations of practice and suggest potential next steps for integrating MLRs. They conclude with implications for mathematics teacher education, emphasizing how educators can better support PSTs in teaching*

DOI: 10.4018/979-8-3693-1164-6.ch002

*multilingual learners effectively.*

## INTRODUCTION

We begin with a vignette of an approximation of practice. *Anabell is a preservice secondary mathematics teacher (PST) who conducted an approximation of practice using the Mathematics Language Routine (MLR) Stronger and Clearer Each Time (Stronger and Clearer; Zwiers et al., 2017), and focusing on the multilingual learner core practice of building on and using multilingual learners' funds of knowledge and resources. Before beginning her approximation, Anabell shared background information about her lesson with the instructors and the other seven PSTs in her mathematics methods course. She explained that her lesson on percentages was intended for a 7th-grade mathematics course, would come after a lesson examining discounts on items for purchase, and was aligned to California Mathematics Standard 7.EE.3 (California Department of Education, 2013).*

*Anabell stepped into her approximation of practice by displaying a PowerPoint slide with a catchy phrase to introduce the MLR Stronger and Clearer (Zwiers et al., 2017). The slide stated: "What doesn't kill you makes you Stronger and Clearer." She then asked the "class" of PSTs the question: "Which is a better discount, \$20 or 20% off?" She asked her PST students additional questions: "Is one always a better deal than the other? When is \$20 [off] a better deal? When is 20% [off] a better deal? Explain. Use examples as needed." To contextualize her questions, to connect to her students' funds of knowledge (the focal core instructional practice), Anabell provided visuals of a car, a pair of shoes, a television, and a blender, all with example prices.*

*Next, as the first step in the MLR Stronger and Clearer, Anabell provided her PST students three minutes of think time. On her slide, she prompted them both to "think about what you are going to say to others" and to consider "ways you might share your thinking," providing sentence frames to support students to engage in conversations with each other:*

- *I think \_\_\_\_ is a better deal because ...*
- *I know this because ...*
- *An example of this is ...*
- *20% [off] is better when ... \$20 off is better when ...*

*After providing this time to think, Anabell moved to the second part of the MLR Stronger and Clearer. She grouped her PST students into pairs and asked them to share their responses in a structured format. She instructed one student to explain their response, while their partner listened and asked clarifying questions, particularly related to having their peer develop "justifying ideas." Students were to switch roles once the clarifying questions were answered. Anabell provided example questions for this step of the Stronger and Clearer MLR, which included:*

- *What is a specific example of that?*
- *How do you know...?*
- *How did you decide...?*

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