

## Chapter 16

# What Preservice Teachers Can Learn From a Content Area Expert: Using a Negotiated Learning Model to Increase Authenticity in Mathematics

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### **ABSTRACT**

*In this chapter, the author presents the negotiation between students and teachers to combat disengagement in a virtual classroom. To address this concern, the chapter presents a model that increases authentic engagement in a mathematics classroom for a group of sophomores, juniors, and seniors using an academic dialogue strategy that prepares students to think critically about what they are learning in the classroom and how these abstract learnings connect to real-world experiences. The dialogues that occur between the author and the students provide an approach that is widely used in literacy settings but may not always happen in content area instruction.*

### **INTRODUCTION**

Within the classroom of diverse learners, there is a high frequency of ritual engagement, passive compliance, retreatment, and rebellion due to increased pressure from school administrators regarding high-stakes assessments from district, state, and national level.

Wachira and Mburu (2019) state that “teachers are being challenged to provide an education that serves the needs of all students as well as the unique needs of particular individuals or subgroups” (p. 2). Given this expectation from campus and district administrators, classroom teachers resort to a “one-size fits all” mindset that results in ineffective teaching and learn. Moreover, the exchange of dialogue between teacher and student is poor which results to low academic expectations for students. Although

DOI: 10.4018/978-1-7998-8725-6.ch016

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students may seem engaged listening to the teacher, they are most likely disengaged from the curriculum. Thus, teachers are required to address many culturally diverse populations so that are able to enhance their teaching and learning practices (Wachira and Mburu, 2019, p. 2). With this paradigm shift with students, this becomes a distorted reality for preservice teachers enter the field for the first time.

In teacher education programs, there has also been an increase in the number of preservice teacher candidates that have shown interest in teaching mathematics in grades K-12. Greet et. al. (2020) asserts that teacher preparation programs have a responsibility to provide preservice teachers with appropriate content, instructional practices, and field experiences so that they are prepared for success in the classroom (p. 145). On the contrary, the college curriculum for mathematics education poorly addresses strategies regarding knowledge, skills, and pedagogy for secondary teacher candidates to be successful in the classroom. Jones, Lake, and Dagli (2005) claim that preservice teachers come into methods courses with preconceptions on how to teach math and science course due to limited experiences and understanding of these subjects. Moreover, they argue that preservice teachers have a conception that mathematical problem solving will result in ineffective classroom practices where engagement is lost in the activity (p. 167). Lovett and Lee (2017) assert that there are challenges to balance preservice secondary teachers with content understanding in their particular subject and pedagogical knowledge (p. 309). Bosica, Pyper, and McGregor (2021) quote the following in their study of project-based learning for preservice teachers:

*Preservice teachers need to not only learn “best practice” pedagogical strategies incorporating issues and topics such as assessment, content knowledge, pedagogical knowledge and classroom management, but they also need to navigate larger issues such as student diversity, inclusivity in their teaching and professional practice, and providing diverse instruction centered around a universal design for learning. (p. 1).*

There are preservice teacher students who have interest in teaching mathematics in grades 8-12 are required to take more traditional academic rigorous courses of mathematics in calculus and statistics, yet their pedagogical content has to be based on various educational philosophies and teaching practices for all student learning in the classroom. Bosica, Pyper, and MacGregor (2021) declarers that this focus for preservice teachers limits the amount of time that teacher candidates can learn effectively (p. 2). Consequently, the inspiration for this study address the gap in literature of how preservice teachers can learn how to effectively engage students in a remote or online setting. Hence, this research study investigation considers the following research questions:

- How can authentic engagement be increased in the mathematics classroom via negotiated learning in a virtual classroom?
- How can a teacher’s experience be used to help preservice teacher candidates in preservice teacher education?

In addressing the research questions of this action research project, a discussion of a condensed and modified form of the Reggio’s negotiated learning is used, following by analysis of peer-reviewed literature that addresses preservice teacher education regarding mathematics preparation in the field along with factors that affect student engagement in the mathematics classroom. Afterwards, a method involving the use of the condensed Reggio negotiated learning model in a mathematics high school virtual classroom

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