

Chapter 7

Promoting Conceptual Understanding Through Authentic Mathematics Instruction in Virtual Environments: More Than a Game

Elizabeth Allison

Western Governors University, USA

Carol PeQueen

Western Governors University, USA

Megan Rzycki

Western Governors University, USA

Kristie Remaly

Western Governors University, USA

Jen Wallender

Western Governors University, USA

M. Amanda Kain

Western Governors University, USA

Adam Hiebel

Western Governors University, USA

ABSTRACT

Delivering effective online instruction to preservice teacher candidates is important to ensure teachers are prepared for K–12 classrooms. Formal education has been reimagined several times throughout history, with both K–12 and higher education settings seeing significant changes in recent decades. Additionally, elementary teachers and preservice teacher candidates often view mathematics as only facts and

DOI: 10.4018/978-1-6684-5939-3.ch007

procedures for memorization—a belief that infiltrates their instructional practices. Colleges that prepare teacher candidates must respond to this misconception. This chapter explores strategies one online university used to help preservice teacher candidates maximize student success by implementing live webinars called Put It into Practice (PiiP). During these sessions, preservice teachers explore online tools that can be used in the K–12 classroom to conceptualize math concepts. The webinars challenge preservice teachers to analyze how to teach math in today’s classroom, while modeling the key prerequisite of establishing a safe psychological environment conducive to learning.

INTRODUCTION

The teaching and learning process has been revitalized and changed in the wake of the pandemic caused by the novel coronavirus (COVID-19). As such, colleges and universities across the nation have been encouraged, or even required, to rethink the way they deliver effective instruction to teacher candidates. Additionally, the pandemic has significantly affected K–12 education, with many of the changes forecasted to be permanent. Therefore, it is imperative that teacher preparation programs across the nation evaluate their core goals and programming options to prepare teacher candidates for the application within the K–12 setting (Black et al., 2021). As such, Patrick (2021) argued that college administrators and policymakers should explore a competency-based model of instruction along with effective and best practices for preparing teacher candidates to work and deliver instruction through virtual platforms, including the effective use of mathematical tools to build conceptual understanding.

Policymakers and university officials who are serious about preparing students for success should fully embrace a whole-system transformation that leads to a more student-centered approach to education (Patrick, 2021). At the college level, policymakers must explore the power of the competency-based model that focuses more on mastering skills rather than seat time or hours on [a] task. “A competency-based structure is built upon personalized learning experiences tailored to each student’s strengths, needs, and interests and requires student voice and choice in what, how, when, and where they learn” (Patrick, 2021, p. 23).

The process of creating a positive educational experience must be a conscious effort in which an atmosphere of learning is active. Education is not separate from learning, and it is important to remember and plan with a purpose. Mathematics is a basic science and, as a subject, studied at various levels. It also provides a tool to guide thinking and enhance problem-solving abilities. Therefore, it is essential that

26 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/promoting-conceptual-understanding-through-authentic-mathematics-instruction-in-virtual-environments/338413

Related Content

Teaching Fire Safety in Schools of Architecture: The Spanish Case

Juan Bautista Echeverría and Maria Fernández-Vigil (2023). *Advancing STEM Education and Innovation in a Time of Distance Learning* (pp. 189-210).

www.irma-international.org/chapter/teaching-fire-safety-in-schools-of-architecture/313733

Saudi Arabia's Vision 2030 and Its Impact on STEM Education

Holly Nicole Babineau (2023). *STEM Education Approaches and Challenges in the MENA Region* (pp. 74-90).

www.irma-international.org/chapter/saudi-arabias-vision-2030-and-its-impact-on-stem-education/327906

Using Technology in a Studio Approach to Learning: Results of a Five Year Study of an Innovative Mobile Teaching Tool

Dianna L. Newman, Gary Clure, Meghan Morris Deyoe and Kenneth A. Connor (2015). *STEM Education: Concepts, Methodologies, Tools, and Applications* (pp. 1349-1366).

www.irma-international.org/chapter/using-technology-in-a-studio-approach-to-learning/121905

Zoology Pathway Program: Partnering for Student Success

Claire Lannoye-Hall (2023). *Developing and Sustaining STEM Programs Across the K-12 Education Landscape* (pp. 213-231).

www.irma-international.org/chapter/zoology-pathway-program/329947

Supporting the Enactment of Standards-based Mathematics Pedagogies: The Cases of the CoDE-I and APLUS Projects

Drew Polly, Christie Martin, Chuang Wang, Richard G. Lambert and David Pugalee (2016). *Innovative Professional Development Methods and Strategies for STEM Education* (pp. 137-148).

www.irma-international.org/chapter/supporting-the-enactment-of-standards-based-mathematics-pedagogies/139656