Using a Japanese Framework to Deepen Preservice Teachers' Knowledge of Multiplication

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Abstract

This paper describes an application of the principles of AMATYC's *Beyond Crossroads* document in a mathematics course designed for preservice elementary teachers by showing how their investigation of multiplication—using a definition of multiplication from Japanese elementary grades textbooks—provides content knowledge that is beyond and deeper than the mathematics that they will teach. In particular, preservice elementary teachers experience how a mathematical concept permeating throughout a mathematics curriculum builds a learning progression that connects models, definitions, and mathematical structure to concepts associated to algebra. Throughout the course, using this definition of multiplication when multiplying whole numbers provides connections to other interpretations of multiplication when multiplying rational numbers, and to rates of change in linearity. In addition to a mathematical discussion of the Japanese approach and its presentation in the course, the paper notes what preservice elementary teachers enrolled in this mathematics course glean from their exploration of multiplication through such a cultural lens.

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