

Chapter 5

Building on What They Bring: Special Considerations when Working with Young Immigrant Students in Mathematics

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ABSTRACT

As each child arrives in school with a series of family-provided and possibly previous-schooling-provided memories and experiences to draw from, culturally responsive teachers probe, learn about, and build upon these opportunities. With a focus on ways to best tailor instruction to capitalize upon the strengths each child brings to the classroom, this chapter explores some of the ways cultural norms around mathematics may shape a young child's early mathematical experiences in a U.S.-based school setting. Additionally, this chapter includes a focus on the key role of families and ways culturally mediated beliefs about the role of the teacher and learner influence mathematics instruction. Further, this chapter touches upon several specific mathematical examples that differ around the world.

INTRODUCTION

Across the United States, teachers and curriculum leaders must grapple with two key challenges: increased standardization in mathematics content expectations, and increasing participation by immigrant children in mathematics instruction.

Beginning with the National Council of Teachers of Mathematics (NCTM) *Agenda for Action* (1980), through multiple NCTM Standards (1989, 2000), up through 2008's NCTM *Curriculum Focal Points*, and now with the Common Core State Standards Initiative (2010), young children today are being increasingly asked to think independently, creatively, and broadly, with a push to generate their own ideas and thinking while

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preparing justifications for their own work. Gone are the days when the paradigm of active teacher/passive student was in play, and gone are the days when mathematics education was framed as a transmissive model, with teachers handing down information to students. Additionally, children are being asked to think critically about the work of other students, inquiring to understand how they have made sense of different ideas.

The ascendancy of reform mathematics has taken place during a period of rapid growth in the U.S. immigrant population. Since 1970, immigrants tripled their share of the total U.S. population; since 1990, children of immigrants have doubled their share of total U.S. children, now making up a quarter of all students in U.S. schools (Passel & Cohn, 2008). Mathematics in the U.S. means mathematics for young immigrant children.

Meanwhile, the new mathematics content celebrates problem-solving and social learning. For example, the NCTM Process Standards (2000), which are intended for children from pre-kindergarten through grade twelve, require that students “make and investigate mathematical conjectures,” “communicate their mathematical thinking coherently and clearly to peers, teachers, and others” and “analyze and evaluate the mathematical thinking and strategies of others,” in addition to other process-oriented competencies. Although it is suggested that these processes of communicating thinking may be culturally appropriate for many learners (Berry, 2003), they are not necessarily widely practiced outside the U.S. (and in truth, are not fully embraced by more traditional educators within the US. either (McKinney, Chappell, Berry, & Hickman, 2009).

With similar intentions, the authors of the CCSS also crafted standards designed to guide educators in fostering similar communicative competence in mathematics. Titled, “Standards for Mathematical Practice” (Common Core State Standards Initiative, 2010), these standards prompt students to “construct viable arguments and cri-

tique the reasoning of others,” and “monitor and evaluate their [own] progress and change course if necessary,” and “justify their conclusions, communicate them to others, and respond to the arguments of others.” In sum, as with the NCTM Process Standards, the CCSS Standards for Mathematical Practice seek to cast students as agentic, engaged, efficacious and participatory contributors to their own sense-making in mathematics-- which echoes the work of Hilliard (1991), who asserted the need to teach students deep understanding of mathematics concepts rather than simply having them memorize procedures, and who believed that true excellence in mathematics involved not just solving problems, but being able to communicate effectively about one’s thinking.

However, for many adults (including both educators and families of students), this way of thinking may not only be unfamiliar, but may also be uncomfortable or may even represent a violation of a deeply-held norm or conviction about the roles of teachers and students and the way “real” mathematics are done (Handal, 2003). For adults whose initial educational experiences were built around the transmission (“sit and get”) approach, un-learning this way of thinking and embracing a more student-centered approach can be challenging.

What, then, are the implications for educators? And how are these implications even more complex for families with young immigrant learners who may be learning a new language as well?

In this chapter, we will focus not only these implications for educators, families, and children, but will also explore ways to best tailor instruction to capitalize upon the strengths each child brings to the classroom, and highlight some of the ways cultural norms around mathematics may shape a young child’s early mathematical experiences in a U.S.-based school setting. Additionally, this chapter will include a focus on the key role of families, and ways culturally mediated beliefs about the role of the teacher and learner may shape mathematics instruction, particularly with

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