Chapter 8

Teaching Mathematics to Elementary ELL Students

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ABSTRACT

The number of English language learners (ELLs) is increasing rapidly at U.S. schools. Mainstream teachers have an important role in the academic success of these students because ELLs spend most of their school time in mainstream classes. They are pulled out a few hours in a school day for ELL services. Therefore, it is crucial to educate mainstream teachers in how to teach ELL students. Mathematics is one of the hardest topics for ELLs. This chapter aims to uncover some of the challenges that elementary ELLs have in math classes and provide some implications on how to better teach math to ELL students.

INTRODUCTION

Approximately 4.6 million English Language Learners (ELLs) were enrolled in U.S. public schools in 2014-2015 school year. ELLs composed almost 10% of whole K-12 school population (National Center for Educational Statistics [NCES], 2016), and 17% of all elementary school population in the U.S., with 3.5 million ELLs enrolled in K-5 classes in 2015. In other words, majority of ELL students, almost 70%, were enrolled in elementary grades (NCES, 2016).

Since ELLs already comprise an important portion of whole school environment, and in particular elementary grades, learning environments are required to be optimized for ELLs in order to support the entire K-12 educational infrastructure. The most important issue facing elementary teachers in educating ELLs is closing the achievement gap between ELL and non-ELL students. ELLs lag behind their non-ELL peers in almost all subjects (Fry, 2008), including mathematics. They score consistently lower than their
non-ELL peers in mathematics, and consequently they are not placed in advanced mathematics classes (NCES, 2016) at higher grade levels. Therefore, it is important for teachers to ensure that ELLs have equitable access and opportunities to learn equivalent rigorous mathematics content as their competent English speaking peers, with comprehension (National Council of Teachers of Mathematics [NCTM], 2013). In this chapter, we discuss the issues in teaching mathematics to ELLs, and suggest solutions.

ISSUES IN TEACHING MATHEMATICS TO ELLs

Academic Success of ELLs

Many teachers have a misconception that mathematical skills do not depend on language skills (Breeser, Melanese, & Sphar, 2008); or they confuse restricted language skills with mathematics learning disabilities, and refer ELLs to special education services or lower level math classes (Abedi, 2009, Chu, 2011). As a matter of fact, mathematics require proficiency in language skills since students need to understand the problem that is being asked to them, and they need to be able to express their reasoning. Moschkovich (2015) states that “mathematical discourse” (p. 43) is part of mathematics literacy, and students need to be able to discuss mathematical problems. However, it takes 5-7 years for ELLs to acquire proficiency in academic English (Abedi & Herman, 2010). ELLs learn English at the same time that they learn new concepts in mathematics, which is taught in English, as well as academic language of mathematics. Therefore, language needs of the ELLs should be considered when designing mathematics instruction for all.

Nationwide test results indicate that ELLs struggle in mathematics, and they continuously lag behind their peers in standardized mathematics assessments (See Figure 1). The achievement gap between non-ELL and ELL students was around 25 points at fourth grade mathematics test in 2015 (NCES, 2016).

Figure 1. Grade-four mathematics scores for ELLs and non-ELLs: 2000 to 2015

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