

## Chapter 10

# Using Culturally Responsive Teaching and Data-Driven Instruction in Mathematics to Create Equity and Equality: Culturally Responsive Mathematics

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### **ABSTRACT**

*The diverse nature of school populations in current education requires teaching that not only considers the differences in their students, but how their own practices have an impact on a student's ability to learn content. Traditional Eurocentric models of education are not relevant to the lives of racially culturally ethnically linguistically diverse students, thus creating barriers to learning for students who do not fit neatly into categories of Black or White. For the academic environment to be accessible for all students, classroom instruction must become culturally aligned. This may be somewhat of a challenge given that classroom teachers are ill-prepared to meet the needs of RCELD students in math education. Teachers are faced with the critical challenge of creating learning environments that bridge the gap between culture and curriculum with appropriate strategies and resources, while all the while adhering to state and federal standards. This chapter explores using culturally responsive teaching to teach mathematics.*

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## **INTRODUCTION**

The recent demand for schools to respond to accountability measures, challenges school teachers to use data to guide the practices of teaching in their efforts to develop skills of racially culturally ethnically linguistically diverse (RCELD) students in today's classrooms. Despite student achievement criteria outlined in No Child Left Behind (NCLB, 2001), achievement gaps between minority children and their peers continue to exist (Guisbond, Neill & Schaeffer, 2012), particularly persistent gaps in math achievement.

Curriculum must consider the differences that exist among student populations (Falcon, 2009). Studies into best practices for teaching in diverse classrooms pointed to "a lack of cultural perspectives in the mathematics curriculum" (Yao, 2016, p. 1809). Classroom teachers are ill-prepared to meet the needs of RCELD students in math education. Students' prior knowledge and background are important considerations (Ladson-Billings, 1997) that must be supported in the teaching and learning process. To meet the demands of contemporary public education, the principles of instruction need to be transformed to provide equal and equitable access to the curriculum. This is noted in the definition of culturally responsive mathematics teaching (CRMT), identifying it as a set of specific pedagogical knowledge, dispositions, and practices that privilege mathematical thinking, cultural and linguistic funds of knowledge, and issues of power and social justice in mathematics education (Turner, Drake, McDuffie, Aguirre, Bartell & Foote, 2012). In other words, teachers need to look at children not only from a mathematical viewpoint but also from a complete socio-cultural background (See Figure 1, Cultural Iceberg Model).

## **BACKGROUND**

The United States will undergo a major transformation in the next two decades, with people of color comprising roughly 45% of the population (Institute of Educational Sciences, 2011); by 2050, RCELD children will make up approximately 50% of student populations in public schools in America (Howse, 2013). There is already evidence of a cultural shift. A survey conducted by the United States Department of Education cited a 57% increase in the number of Limited English Proficient (LEP) children enrolled in Pre-K-12 public schools between 1995 and 2006 (International Center for Leadership in Education, 2011). The National Center for Education Statistics (2017) reported, "In fall 2014, the percentage of students enrolled in public elementary and secondary schools who were White was less than 50 percent for the first time and represents a decrease from 58 percent in fall 2004" (para. 1). As a result, teachers are faced with the critical challenge of creating learning environments that bridge the gap between culture and curriculum with appropriate strategies and resources, while all the while adhering to state and federal standards (International Center for Leadership, 2011).

## **Issues, Controversies, and Problems**

As educators face increasing pressure from federal, state, and local accountability policies to improve student achievement, the use of culturally responsive teaching practices has become critical to how educators interact with their students and how students grasp core concepts in the content areas. This is especially true when it comes to developing the academic skills of RCELD students who may demonstrate deficits that impact their ability to be productive in the class setting. Ladson-Billings (1994) first used the term culturally relevant about pedagogical practices "that empowers students intellectually, socially,

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