

Chapter 6

Attitudes towards Diverse Learners: A Hybrid Technology Course for Secondary School Mathematics Pre/In-Service Teachers

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EXECUTIVE SUMMARY

University educators are often faced with the challenging task of equipping both pre-service and in-service teachers with the knowledge, skills, and resources to effectively teach diverse students. It becomes even more problematic to teach mathematics when using a problem solving approach where mathematical ways of knowing are emphasized. These teachers tend to believe that mathematics is “just numbers,” “speaks a universal language,” is “culturally neutral” and has no relevance whatsoever with social issues that affect students. Coupled with this is the mistaken belief that “people know or don’t know math.” Pre/in service teachers, often meet the notion that math literacy can be achieved by all learners with skepticism and patronizing behaviors. However, given the space to step outside the classroom, talk with peers, and argue with veteran teachers, a shift in attitude about the potential for diverse student potential is self-evident. These preliminary findings were assembled when a hybrid course that enrolled eight pre/in-service teachers was developed.

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ORGANIZATION BACKGROUND

Teaching Mathematics to Diverse Learners

American students continue to lag behind in mathematics compared to their counterparts in advanced nations with dire social and economic consequences. A recent study found that 15-year-old American students ranked at 25th out of 30 developed countries in an assessment that measured “real-world (applied) learning and problem solving ability” (McKinsey, 2009, p. 7). Further disaggregating of this data paints an even grimmer picture when race and social economic status are considered. In those same areas of measurement, Black and Latino students are roughly two to three years behind White students of the same age and so are students from low-income families (McKinsey, 2009). The National Assessment of Educational Progress (NAEP) results for eighth graders show 59% of Black and 50% Hispanic students scored below basic in mathematics and only 1% of the two racial groups scored at the advanced mathematics (NCES, 2006). These findings would not be as alarming were it not for the social and economic implications faced by the nation. “These educational gaps impose on the United States the economic equivalent of a permanent recession” (McKinsey, 2009, p. 5).

Leonard (2008) argues, “mathematics is the gatekeeper for access to higher education and higher paying jobs” (p. 16). Indeed, low scores in mathematics for American students indicate that full utilization of human potential is in jeopardy and in some communities, very costly. If low income and students of color do not achieve in mathematics, they will be unable to compete for a variety of high status and high paying jobs. Likewise, White middle class students with low scores in mathematics are being prepared for “\$12 an hour jobs—not for \$40-\$50” as those from high achieving nations (Miller as cited in Friedman, 2009). At the individual level, low scores in mathematics reduce the chance of further education and access to economic mobility. As Osler (2007) argues the consequences are high unemployment rates and a growth in number of people incarcerated, which is counterproductive given the enormous cost of maintaining corrections (Webb, 2009). The questions to ask then are (a) what has led to this decline in mathematics achievement for low income and students of color in the United States and (b) what can be done to reverse this trend?

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