Chapter 4.4
Re-Examining the Socioeconomic Factors Affecting Technology Use in Mathematics Classroom Practices

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ABSTRACT

Over the past 15 years a considerable amount of research has been devoted to study of the socioeconomic aspects that affect the use of technology in the mathematics classroom. With the call for curricular and instructional reform, educational institutions have embarked on the process to reform their educational practices to aid the urban student in their quest to obtain quality mathematics and science based education with the integration of technology. The study performed was to reexamine the socioeconomic disparities in the mathematics classroom as it relates to implementing technology interventions to support quality teaching and active student learning. This article is to provide empirical evidence of whether these disparities continue to exist and their effects on student achievement in the mathematics classroom. The results of this study showed an overall positive relationship regarding the use of technology interventions within the mathematics classroom with levels of student achievement,

showing a clear signs of continued disparities within mathematics classroom.

INTRODUCTION

The introduction of microcomputers into classrooms during the 1980's was heralded by many as the dawn of a new era in American education. Proponents argued that technology had the potential to fundamentally transform the nature of teaching and learning (Papert, 1980; U.S. Congress, Office of Technology Assessment, 1988). However, over time, it has become apparent that it is far easier to acquire hardware, software, and Internet access (Becker, 1991; Dividing Lines, 2001) than it is to capture the potential of technology in significantly meaningful outcomes (Cuban, 2001). Likewise, educators concerned about the chronic underachievement of students often fall prey to the allure of technology as a tool for reversing the historical influences of poverty, discrimination, inequity, chronic underachievement, and lack of opportunity. However, 25 years after the introduction of the computer into the classroom, many of the expectations associated with technology in education remain unrealized to some but to other, technology has proven to be an effective tool in the efforts to provide students with opportunities for quality teaching and active student learning and engagement.

Educational institutions have called for instructional and curriculum reform that includes active engagement of students, quality assessments, and the increased and innovative use of technology applications to promote quality teaching and active student learning (U.S. Department of Education, 2001). This is true in the field of mathematics where organizations such as the National Council of Teachers of Mathematics (1989, 2000), Mathematical Science Board (MSEB, 1991), and Mathematics Association of America (1991) have stressed that technology is essential in teaching and learning mathematics. The underlying assumption of these organizations and math educators alike is that technology will enable students to explore mathematics with a greater depth and will allow them to study topics that were previously impractical (Garofalo, Drier, Harper, Timmerman, & Shockey, 2000). However, in order for technology to have greatest impact on our educational system, all students must have access to technology. For that reason technology has the potential to narrow the achievement gap, if equally distributed or widen the gap if only accessible to selected groups in the educational system (Kulik, 2002; Waxman, Connell, & Gray, 2002).

REVIEW OF LITERATURE

Over the past 15 years a considerable amount of research has been devoted to sociocultural disparity in technology availability and use in the mathematics (Becker, 2000; Garofalo et al., 2000; Means et al., 2001; Manoucherhri, 1999; National Center for Educational Statistics, 2004; Owens, 1993; Owens & Waxman, 1994, 1995; U.S. Department of Education, 2001; Huang & Waxman, 1996). Past studies conducted by Becker (2001) and Coley, Cradler, and Engel (1997) found students from higher income families have been found to use computers in school and in their homes more frequently than students from lower-income families. Students of color from urban schools have also been found to have less access to computers compared to Anglo-suburban students (Owens & Waxman, 1993, 1994). More recently, lower SES schools are only half as likely to have high speed Internet compared to high SES schools (Advanced Telecommunications, 1997). Consistent with this idea of access are the issues within the digital divide itself. Within the past decade, a growing body of evidence supports the ever-widening technological gap among members of society, in particular children and the elderly (NTIA, 1995, 1997, 1999), with a important emphasis on urban