Chapter 2

Sociotechnical and Pedagogical Barriers to Technology Integration

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ABSTRACT

This chapter explores barriers to technology integration in school-based learning environments. Recent research suggests that such barriers play a significant role in reproducing digital education inequities, otherwise known as the “Educational Digital Divide” (Hohlfeld, Ritzhaupt, Barron, & Kemker, 2008). Indeed, barriers to integration significantly impact the frequency and purpose of technology use in the classroom, as well as students’ opportunities to develop critical 21st century skills that can be utilized for the betterment of their personal and academic lives. From a sociocultural perspective, many of these barriers implicate elements of institutional structures, as well as teachers’ attitudes and beliefs about technology and learning.

INTRODUCTION

The proliferation of smart phones, tablets, and laptop computers over the past decade has accompanied a growing interest in implementing these tools in classroom instruction, particularly for large scale initiatives such as one-to-one device and ubiquitous computing programs (Zucker, 2004). While commonly heralded as an advance for education, there has been a mounting concern within the education research community that such programs impact students’ classroom experiences and digital skills in ways that exacerbate learning inequalities (Sims, 2014; Warschauer, 2004; Wilson, 2014). As reports that the digital divide is narrowing with regard to children’s access to computational tools and the Internet (no doubt in part to the expansion of one-to-one computing in schools), research over the past few years indicates that inequities persist among children’s uses of digital tools, as well as their technological capital (Zhang, 2010). Indeed, the literature shows that youth from urban, disadvantaged, and marginalized communities continue to experience fewer and less-empowering opportunities than their more affluent counterparts to

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develop highly-valued technology skills, particularly in school (Barron, Walter, Martin, & Schatz, 2010; Hohlfield et al., 2008). These and other reports, accordingly, have inspired skepticism among education researchers that technology can serve as a panacea for pedagogical reform, or for improving students’ learning outcomes. Despite commonly held beliefs that the use of digital media and computers in the classroom can make subject matter content more interesting or relevant, and therefore motivate students of all backgrounds to learn, barriers to effective technology integration make realizing the social and educational benefits of learning technologies difficult to actualize. For this reason, digital education research has shifted focus away from issues of access to physical and virtual resources, and instead towards the social and cultural factors that impact youths’ digital learning experiences. The purpose of this summary is to examine a body of selected literature from this small but growing field, that discusses two overarching issues regarding digital education inequities: (1) barriers to technology integration in school-based settings, and (2) the expansion of youths’ action possibilities and opportunities for learning through different uses of technology and digital media.

21st Century Learning and the “Use Divide”

Evidence that youth use technology and media for very different purposes outside of school than in the classroom has led education scholars to examine how new models of instruction can engage students in academic pursuits across the disciplines through the use of technology (Warschauer et al., 2004). Some, as a result, have called for significant changes to the predominant model of schooling, arguing that teachers should focus on equipping students with a range of abilities that reflects a more modern, technology-enriched approach to learning, such as “21st Century Skills” (Bellanca & Brandt, 2010). Such skills encompass a wide range of competencies related to digital communications, data gathering and analysis, and multimedia design – all of which require opportunities to rehearse fundamental skills and uses of technology for a variety of purposes. The influence of this call can now be observed in the increasing rate of broadband networking and student computing programs implemented across U.S. educational institutions (U.S. Department of Education, 2010), as well as the aforementioned growth in one-to-one laptop initiatives. Yet while access to learning technologies has thus improved in remote, underfunded, or historically disenfranchised communities, research suggests that students across these settings use digital media and technology for more “consumer” than “producer”-type activities than wealthier or more advantaged students (Subramony, 2007; Warschauer, 2004; Warschauer & Matuchniak, 2010). This so-called “use divide” has led many in the learning technologies research community to claim that a new generation of digital inequality is taking place, centering on youths’ ability to use digital media and technology to “create, design, build, explore, and collaborate” rather than “simply use technology to consume media passively” (U.S. Department of Education, 2016). Such claims have brought much needed attention to the myriad factors that influence educational technology use, such as the quality and effectiveness of technology integration in the classroom – factors that, arguably, original conceptualizations of the digital divide did not account for.

To be sure, when it was first coined in the 1990s, the term digital divide centered primarily on disparities in individuals’ access to technology and the Internet (Clinton & Gore, 1996). As such, many of the solutions such a problem framed around access alone inspired, were often tied to the quantity of resources, supports, or learning activities, suggesting that more technology and technology infrastructure could ameliorate social inequalities tied to digital education. Since that time, however, the term has been newly adopted to describe both the wide disparity in the quality technology-integrated curricula avail-