The Digitally Excluded Learner and Strategies for Success

Virginia E. Garland
The University of New Hampshire, USA

INTRODUCTION

Information Science and Communication Technologies (ICT) are impacting 21st century learners who are becoming digital citizens and who are also competing globally for economic, social, political, technological and scientific success. In a recent study of "new literacies," Leu et al. (2013) found that "Global economic competition within economies [is] based increasingly on the effective use of information and communication" and that "Public polity initiatives [are made] by nations that integrate literacy and the Internet into instruction" (p. 1151). However, it has become apparent that there are gaps in worldwide economies caused, in part, by the lack of widespread and current technological resources and Internet access in developing nations. Pick and Azari (2008) found that 88% of all Internet users comprise only 15% of the world's population and that "use of the Internet and e-commerce has grown exponentially in recent years. Despite this remarkable growth, the gap in access to the Internet between rich and poor regions of the world is increasing" (p. 93). According to Mok and Leung (2012), "It has been of concern that digital divide will exacerbate existing inequalities, erode traditional community ties, socially exclude the disadvantaged and hinder the growth of the knowledge economy. All these will pose damage to the social fabric internally and international competitiveness externally" (p. 271).

One of the key factors in determining digital literacy on both the national and global levels is the degree of effective ICT use in education (Garland & Tadeja, 2013; Pick & Azari, 2008). Unfortunately, disparities also exist between digitally included and digitally excluded students in developed nations such as the United States (Garland & Tadeja, 2013). This article addresses the need to provide ICT for these groups of digitally excluded learners in elementary and secondary level American public schools: low socio-economic status (SES) students, minority students, English Language Learners (ELL), and students with disabilities.

BACKGROUND

Some researchers focus on the academic and social issues of the "digital divide," a term more prevalent over ten years ago, but used synonymously with "digital exclusion" for the purposes of this article. Digital exclusion for some groups of students in the United States is a serious policy issue on the national, state, and local levels. Epstein et al. (2011) describe the transition from the 1990s "Falling through the Net" issues to the more current Internet access and speed concerns, "The first of these reports, released in 1995, documented systematic gaps in the use of computer networks by socioeconomic status, educational background, race, gender, and geographic location… As Internet use has grown, the debate in the United States has shifted toward a 'broadband divide,' focusing on the implications of similar socio demographic disparities around the availability and use of faster broadband Internet connections" (p. 94).

On the national level, the National Education Technology Plan (NETP) was created in 2010 (U.S. Department of Education) by a blue panel of technology and education experts to address the inequities in digital literacy and the associated poor performance of secondary level students in the United States on international achievement tests, particularly in the "STEM" areas of science, technology, engineering, and mathematics (Garland & Tadeja, 2013). The term "digitally excluded" was prominently featured in the NETP proposal, which urged educational leaders to provide more technology resources and training for teachers serving low socio-economic status students,

minority students, English language learners, and students with disabilities. In this article, "students" is generally used in reference to elementary and secondary level students in public schools across the United States, although there is some additional research on post-secondary level students.

DIGITALLY EXCLUDED LEARNER GROUPS

The achievement gap between rich and poor, between white and non-white, between English and non-English speaking, and between disabled and non-disabled students in schools across the United States continues. Of particular national concern is the underrepresentation of African-Americans and women in science, technology, engineering, and mathematics (STEM) disciplines (Hernandez et al., 2013). However, appropriate use of ICT by professionally trained teachers can help bridge the disparities in learning outcomes. Classroom interventions, universal student access to the Internet at school and at home, and greater use of assistive and language translation technologies are some solution strategies discussed at the end of the article.

Although Internet access in low SES schools has improved, there is still widespread lack of computers and Internet access in homes of families in poverty. In their study of over eight thousand kindergarten, first and second grade level children, Judge et al. (2006), found that higher ICT use in schools and at home was positively correlated with academic achievement, "Digital equity is a social justice goal, ensuring that all students have access to information and communication technologies for learning, regardless of socioeconomic status (SES), disability, language, race, gender, or any characteristics that have been linked with unequal treatment. Equitable access to technology resources (e.g., computers, software, connectivity) is one aspect of the concern for digital equity" (p. 52). In addition, the improvement in technology resources in low SES schools may be misleading, as poorly trained teachers in those areas may not be embedding technology in effective instructional practices, relying more on "drill and practice" activities than constructivist, problem solving learning through newer digital tools (Garland & Tadeja, 2013). Similarly, in their study of over one thousand at risk seventh grade students, Hutchison and

Henry (2010) found that this group used the Internet more outside of school than in school, but that these underserved middle school students lacked the "literacy based skills" of their more advantaged peers.

As discussed in the next sections, the majority of current research indicates that the lack of high speed Internet access, appropriate digital tools, and assistive technologies negatively impacts the learning opportunities of students who are poor, African-American, female, non-English speaking, and disabled.

Socio-Economic Status (SES) Students

Students living in urban and rural areas of poverty, in schools with other children of low SES, have far fewer digital learning tools and technology "savvy" teachers than their wealthier counterparts in the suburbs. In a recent study of Ohio third grade teachers and students, Wood and Hawley (2012) found that ICT use was more "sophisticated" in affluent suburban elementary schools, as compared with their urban and rural counterparts, "Overall, the discrepancies in ICT use and resources can be understood as not only symptomatic of persistent, broader social inequalities, but also factors that reinforce such inequalities as well" (p. 20). Divisions in race and class in low SES communities are thus widened further by the lack of digital tools and Internet access.

Schrum and Levin (2009) elaborate further on the lack of availability and access to ICT by students in low SES schools, "Full-time technology coordinators are less likely to be found in schools with high percentages of students qualifying for free or reduced lunch, whereas parents in wealthier schools are more likely to volunteer and supply extra funding for technology and support as well as have a greater ability to get corporate sponsors. These factors affect access, of course, but they also affect the manner in which the technology is used for educational goals" (168). Thus, school administrators in schools with students of poverty must prioritize technology planning and implementation, including addressing issues of funding ICT resources and providing meaningful teacher professional development. Most minority students and English Language Learners (ELLs) live in low socio economic areas, but their specific needs are discussed in the next two sections.

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