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Technological Inequality in Education

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Abstract

This paper investigates the technological divide: that gulf that develops between rich and poor school-age children, and how they gain access to and utilize either effectively or not the wealth of information technology promises to provide. Inequality of educational opportunity has existed since the very first schools in the United States, when men like Horace Mann tried to level the information playing field with the common school and common library.

Introduction

Over two hundred years ago, Horace Mann, thought of by many to be the father of American education, wrote that: “He wanted a school that would be available and equal for all, part of the birth-right of every American child, to be for rich and poor alike” (Mason-King, 2002, para. 2). Mann thought every child, rich or poor, deserved an equal opportunity at an education. To date, this idea has not yet become a reality. However, a new inequality has surfaced: technological inequality has become another obstacle to equalizing educational opportunities for all. Surprising, as it may seem, technological inequity does not stem from the actual number of computers in each school. Lack of Internet connections, technical support, proper software and accessories, teacher training, and other resources are the reasons for a growing technological divide between rich and poor. The inequality is a result of a shortage of appropriate resources available to integrate the computers into an effective curriculum, and perhaps insufficient “attention to the social contexts in which these technologies might be used” (Warschauer, 2003, p. 44).

The number of households with a computer in the United States more than doubled from 1994 (24.1 percent) through 2001 (56.5 percent) (National, Chart H1, 2002).

- In September 2001, 174 million people (or 66 percent of the population) in the United States used computers.
- In September 2001, 143 million Americans (about 54 percent of the population) were using the Internet – an increase of 26 million in 13 months.

- Between December 1998 and September 2001, Internet use by individuals in the lowest-income households (those earning less than \$15,000 per year) increased at a 25 percent annual growth rate.
- Between December 1998 and September 2001, Internet use among individuals in the highest-income households (those earning \$75,000 per year or more) increased from a higher base, but at a much slower 11 percent annual growth rate.
- Between August 2000 and September 2001, Internet use among Blacks and Hispanics increased at annual rates of 33 and 30 percent, respectively.
- Between August 2000 and September 2001, Whites and Asian American and Pacific Islanders experienced annual growth rates of approximately 20 percent (National, Executive Summary, 2002).

Computer and Internet usage in the home have increased substantially over recent years and continue to increase. In an attempt to keep up with society, many schools have begun to increase their technological capabilities as well.

“In 1999 there was one computer for every 5.7 students, up from one per 10.8 students in 1994 and one per 19.2 in 1992” (McAdoo, 2000, p. 143). Our country has done a good job allocating computers to all of our schools, both rich and poor alike. The equity problem is not in the number of computers, but the quality and quantity of resources available to use these computers efficiently. “While rich and poor schools have about the same ratio of computers to kids, the poorest schools have an average of one Internet-connected computer per every 17 students, versus one for every ten students in wealthier districts, according to an Education Week special report, ‘Technology Counts ’99’” (McAdoo, p. 144). Internet connections allow children access to enormous amounts of research and information.

Just as poorer schools have fewer Internet connected computers, they also have a greater deficiency in technical support and appropriate software and accessories. “Education Week found that 30 percent of U.S. schools had full-time technology coordinators in 1998, up one percentage point from 1996. But in schools where more than 70 percent of students qualified for free lunch, only 19 percent had full-time coordinators in 1998, down from 26 percent two years before” (McAdoo, 2000, p. 146). It is definitely not a good sign that the number of full-time technology coordinators, in poorer schools, actually decreased by 7 percent from 1996 to 1998. “In the 1998 Teaching, Learning, and Computing (TLC) Survey, Henry Becker and Ronald Anderson found..... a ratio of 70 students to one multimedia computer in high-minority schools, compared to 25 to one in schools with few or no minority students” (Riel, 2000, p. 161). Appropriate software and accessories allow students to take advantage of the full capabilities of the computers. Poorer schools just do not have the same number or quality of resources as wealthier schools.

Middle and upper socio-economic groups have a greater opportunity to obtain more advanced technology. “In the fall of 2000, the U.S. Department of Commerce found that 86.3% of households earning \$75,000 and above per year had Internet access compared to 12.7% of households earning less than \$15,000 per year. White (46.1%) and

Asian American & Pacific Islander (56.8%) households continued to have Internet access at levels more than double those of Black (23.5%) and Hispanic (23.6%) households” (Digital, 2002). On average, Whites and Asian American and Pacific Islanders have greater incomes than Blacks and Hispanics. Monetary differences play a major role in determining whether households have Internet access or not.

The issue here is one of economics, not necessarily race because based on 2001 statistics, only 26.9 percent of Whites making less than \$15,000 had a computer in their homes. This compared to 52.5 percent of Asian American and Pacific Islanders, 13.3 percent of Blacks, and 18.1 percent of Hispanics. For the population making between \$15,000 and \$34,999 the number of households with a computer rose to 46.4 percent of Whites, 57.3 percent of Asian American and Pacific Islanders, 31.6 percent of Blacks, and 34.6 percent of Hispanics. For those making between \$35,000 and 74,999 the number of households went up to 73.4 percent of Whites, 82.0 percent of Asian American and Pacific Islanders, 61.8 percent of Blacks, and 60.5 percent of Hispanics. \$75,000 and up consisted of 89.6 percent of White households, 91.4 percent of Asian American and Pacific Islander households, 83.1 percent of Black households, and 81.6 percent of Hispanic households (National, Chart H4, 2002).

It is clear that as income increases, so does the likelihood of a home computer. This is true regardless of race. However, one disturbing statistic is that, in every income bracket, the percentage of Black and Hispanic families owning a computer is lower than the percentage of White, Asian American, and Pacific Islanders in that income bracket. This means that Black and Hispanic families who are earning the same amount of money as White, Asian American, and Pacific Islanders are still spending less money on computers.

The percentages of Black, Hispanic, White, and Asian American and Pacific Islander households with Internet access in 2001 seem to follow the same trend as the percentages of households with computers. As a household’s income increases, so does the possibility that the household has Internet access. Again, this is true regardless of race. Also, Black and Hispanic families who are earning the same amount of money as White and Asian American and Pacific Islander families are spending less on Internet access. 20.8 percent of Whites, 45.0 percent of Asian American and Pacific Islanders, 9.2 percent of Blacks, and 12.8 percent of Hispanics earning under \$15,000 had Internet access in their households. From \$15,000 to \$34,999 it was 39.1 percent of White households, 51.5 percent of Asian American and Pacific Islander households, 23.4 percent of Black households, and 23.3 percent of Hispanic households. \$35,000 to \$74,999 consisted of 66.5 percent of Whites, 76.2 percent of Asian American and Pacific Islanders, 54.7 percent of Blacks, and 51.0 percent of Hispanics with Internet access in their households. For an income of \$75,000 or more, it was 86.2 percent of White households, 89.8 percent of Asian American and Pacific Islander households, 77.0 percent of Black households, and 75.6 percent of Hispanic households (National, Chart H9, 2002). Since Black and Hispanic families in the same income bracket as White and Asian American and Pacific Islander families are spending less on computers and Internet

access, it seems clear that money is not the only factor that determines whether a household has computer or Internet access.

Money is not the only reason for technological inequality. Another reason may be the level of education in a household. As of March 2001, 86 percent of Whites completed high school or higher, 74.6 percent of Blacks completed high school or higher, and 53.1 percent of Hispanics completed high school or higher. Also as of March 2001, 25.9 percent of Whites finished four or more years of college, 13.8 percent of Blacks finished four or more years of college, and 9.3 percent of Hispanics finished four or more years of college (Education, 2000-2003). These statistics show that a greater percentage of Whites have graduated high school, or completed four years of college, compared to Blacks and Hispanics.

“According to the U.S. Commerce Department’s July 1999 report, *Falling Through the Net: Defining the Digital Divide*.... roughly 16 percent of households in which parents did not finish high school have computers at home, versus 69 percent of those in which parents have bachelor’s degree or higher” (McAadoo, 2000, p. 147). Over four times as many households headed by college graduates have a computer when compared with households in which the parents did not complete high school. “In the fall of 2000, the U.S. Department of Commerce found that nearly 65% of college graduates have home Internet access; and only 11.7% of households headed by persons with less than a high school education have Internet access” (Digital, 2002). Over five times as many households headed by college graduates have Internet access as compared to households headed by persons who did not finish high school. A person’s educational level seems to play a significant role in determining whether a person owns a home computer or has Internet access.

“The Commerce Department reports that between 1997 and 1998, the gap in computer ownership increased by 25 percent between those at the highest and lowest educational levels” (McAadoo, 2000, p. 147). The use of computers is becoming an integral part of our society, and better educated people are making sure they own computers, while the less educated are not. “Today’s recent college graduates, who live by the Internet and are masters of computing, are part of a new work culture that may turn out to be as revolutionary in its way as the Industrial Revolution was 200 years ago” (McAadoo, p. 150). Our work force is quickly becoming dominated by technology, causing great inequity between and among people who are technologically capable and those who are not. “In this culture, equity will result both from computer skills and from young people’s ability to apply those skills in new ways. From this perspective, the issue of technological equity becomes a broader issue of educational equity, at once tougher but more familiar, requiring whole-school reform, and demanding to be solved” (McAadoo, p. 150). Technological inequity is a more important problem than educators are giving notice. We need not only realize the importance of technology in our society and make the appropriate adjustments in our schools to conform, but understand that teacher training, technical support, computer software, and Internet access are necessary components of reducing this technological divide. A school-home link will also help reduce technological inequality.

“Computers for Youth (CFY) is a New York City-based nonprofit that provides inner-city students and their teachers with fully-equipped home computers and comprehensive services including training, technical support and tailored web content” (Stock, 2002, para. 2). Mainly, they provide students’ homes with computers and ongoing technical support, along with training for the students, parents, and teachers. In one study, CFY selected an inner-city public middle school in the South Bronx. The study “shows that overall the same percentage (90%) of CFY students were using their home computer as were other school-age children across the nation. It also shows that a dramatically higher percentage of CFY children were using their home computers for word processing (80%) than were lower-income students (24%) and even higher-income students (50%) across the nation” (Stock, para. 4). CFY found that when service representatives visited the partner school, compared to when they simply had a service site in the community, the children with computer problems came to them more frequently. Having technical support and training in a school is critical to the success children have with computers. Technical support provides a quick and easy way for children to solve their everyday computing difficulties.

Families involved in the CFY program became captivated with their computers after learning how helpful they can be. “Once the computers were taken home, the families make additional investments in the technology by purchasing complementary equipment such as printers, scanners, or educational CD-ROMs. These investments suggest that the families value their home computers and have found them useful” (Stock, 2002, para. 6). Computers at home can make a difference in a child’s education, especially as he gets older and receives more homework. “The home is where family members can spend unlimited hours on a computer, something not possible at libraries or community centers. In addition, studies show that home computers can motivate students to do their homework and encourage parents to become more involved in their children’s education” (Stock, para. 2). If children are forced to go to libraries or community centers to do their homework, it is harder for parents to get involved. By supplying technical support and training, and not just the computers, the CFY program enabled families to have some positive experiences with their computers. People began to realize the benefit of having a computer in their homes.

“An overemphasis on hardware with scant attention paid to the pedagogical and curricular frameworks that shape how the computers are used is common in educational technology projects throughout the world” (Warschauer, 2003, p. 45). Filling all the schools around the United States with an equal number of computers will not begin to solve the problem of technological inequity. In fact, it may expand the problem even more. “This simplistic technical solution, implemented in isolation, would serve to increase the digital divide” (Riel, 2000, p.164). Wealthier schools will be most likely to have Internet connections, technical support, appropriate software and accessories, and teacher training to take advantage of the equipment. So, it is obvious that socio-economic differences contribute to the technological inequality; but a person’s education level seems to play a role as well. It is critical that we pay more attention to the socio-economic effects on computer usage in our schools. If we do not, the technological

inequity will lead to a greater inequity in our technologically advancing society as a whole. “The goal of bringing technology to marginalized groups is not merely to overcome a technological divide but instead to further a process of social inclusion” (Warschauer, p. 47).

“Horace Mann felt that a common school would be the ‘great equalizer.’ Poverty would most assuredly disappear as a broadened popular intelligence tapped new treasures of natural and material wealth” (Mason-King, 2002, para. 3). Mann also believed that all schools, regardless of economic condition, should have a common library. This library would be funded by the community and provide both rich and poor children with access to the same information. In Mann’s time, information access was found in the books in the common school library. That access today comes in large degree via the Internet. Mann’s first common school was in operation by 1839. One hundred and sixty four years later we are still attempting to figure out a way to give an equal opportunity to all.

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