

**In a Race Such as This Does Anyone Win?
Defining the Digital Divide and the Resulting
Implications.**

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Introduction

The focus of this paper has its roots embedded deep in history. The situation may have begun with Neanderthal man and his challenge to create tools that would enable him to perform tasks easier than his competitors. Or perhaps Johann Gutenberg contributed to the situation when he created his printing press and gave a larger part of the population access to written material. This trend continues today with members of our society competing in the race to keep up, technologically. As fast as new technology is created, those who are able to afford the hardware often purchase it. This gap that exists between those who have access to technology and those who do not, is commonly referred to as the “digital divide”. This paper will review literature that examines the issue of the digital divide, and consider recommendations for remedial action.

As society progresses through the 21st century educators are faced with many technological challenges. Some feel the stress of trying to keep up with advances while others feel that education systems do not do enough to keep pace with advancing technology. As a result of socio-economic, gender and ethnic influences, many members of western society do not have access to technology, placing them at a disadvantage. The students in this situation specifically, face hurdles that will inhibit their success in school and in the working world upon graduation.

Defining the Issue

The early research focus was based on socio-economic disparities that exist in the digital world, but it became clear, subsequently, that this issue was not based solely on economics; there is a much broader area of influence – an array of issues related to equality. Mossberger, Tolbert and Stansbury (2003) defined “digital divide” as “the patterns of unequal access to information technology based on income, race, ethnicity, gender, age, and geography” (p. 1). The definition came about as a result of the technology explosion that occurred during the mid 1990’s, the introduction of the Internet and the dot-com boom in the United States (Warschauer, 2003).

From an economic standpoint the “digital divide” is clearly visible. In our “classist” society, there have always been the “haves” and the “have-nots”. These labels are often used to describe those people who have the financial ability to purchase items when first introduced and those who may have to wait until the cost recovery by the manufacturer is met and prices fall, or those who will never be able to afford the item. Mack (2001) argued that the gap could be narrowed by reduced cost of technology, thus making it more affordable to those with lower incomes. It is argued, however, that a problem occurs when people in this situation choose not to take advantage of reduced prices; they then are considered ignorant about the options available to them (Mack, 2001). The members of this group would then appear to be at fault for not taking advantage of the situation when other factors may be influencing the decision not to access technology.

Callison (2004) argued that the “digital divide” lessens as household income increases. In addition to having the access to technology, students in higher income families are more likely to use the Internet (Masson & Dodds, 2005). Eamon (2004) agreed, and found that in the higher income families less than three percent of adolescents do not use computers compared to 15 percent in the lowest income brackets. This implies that families with a lower socio-economic status are more likely to allocate resources to those items that represent more important needs. Hardware and an Internet connection may not be seen as a financial decision that would benefit the family in the long run.

A second issue related to the “digital divide” is that of race or ethnicity. A gap is clearly evident between races in the world today, primarily between the Caucasian population and minorities in the United States such as African-American, Latino and Aboriginal peoples (Eamon, 2004). This may be the product of the hegemony and the historical segregation that has existed between the Caucasian population and the others, allowing the Caucasian race access to better employment and higher wages. People of European ancestry have had the upper hand when dealing with members of the minority culture. This can be attributed to belief held by early explorers that the Aboriginal people were not as technologically advanced and therefore must be taught by the Europeans. Masson and Dodds (2005) reported that approximately 66 percent of Caucasian children have gone online compared to just 45 percent for African-American children and 37 percent for Hispanic children.

Gordon, Dorr and Gordon (2003) brought to light this issue with an investigation of the Aboriginal peoples of the Four Corners area of the United States. Evidence of the “digital divide” can be seen when one takes a look at the access these Nations have to what would be seen as standard technology. In 2000, 94 percent of households in the United States had phones. Comparatively, only 34 percent of households in the Navajo Nation in the Four Corners area had phones (Gordon, Dorr and Gordon, 2003). It is unlikely then that these Nations would have access to technology such as the Internet.

Cullen (2001) pointed out that people of ethnic minorities are often already at a disadvantage due in part to education and income levels, but even more by the dominance of Western culture in the developed world. The Western culture that promotes a “survival of the fittest” attitude would negatively impact people of minority cultures. This can also be seen in New Zealand with the Maori peoples and their exclusion from technological access – even modest technology by western standards. As of 1996, up to 75 percent of Maori in household with income levels under \$15,000 did not have access to phone lines (Cullen, 2004). While government programs are aimed at closing the divide in this case, the gap has not narrowed due in part to what the Gartner Group suggested are socio-economic disadvantages, not ethnic disadvantages (Gartner as cited in Cullen, 2001).

The gender gap is also a contributing to the “digital divide”, however, Ching, Basham, and Jang (2005) indicated that the gender gap may be narrowing and actually suggested that more females than males are accessing

technology. Callison (2004) supported the belief that the gender gap is narrowing in contrast to the 1990's and that computer and Internet usage rates for males and females are now equal. Mossberger, Tolbert and Stansbury (2003) confirmed this theory, stating that the issues with respect to gender are no longer a result of access, but rather a result of attitudes toward learning or the use of technology. Mossberg, Tolbert and Stansbury (2003) stated that male members of society are more likely to prefer a hands-on type of instruction and are more likely to use the Internet for applications such as a job search.

Kuttan and Peters (2003) reported that there are still areas of concern however, with respect to this gender gap:

- The Internet use rate for Asian American women is 46.1 percent compared to 52.7 percent for Asian American men.
- Of women fifty and older not in the labor force, 15.6 percent are Internet users, compared to 18.1 percent of men in the same group.
- In single-parent families, 30.0 percent for female-headed households have Internet access, compared to 35.7 percent for male-headed households (60.6 percent of dual-parent households have Internet access).
- In inner cities, only 22.8 percent of female-headed, single-parent households have Internet access (p. 38).

Cullen (2001) argued that while the gap has narrowed in the western world, female usage rates could be as low as five percent in developing countries. This could be a result of the oppressive cultural attitude towards females still evident in many Eastern and Middle Eastern societies.

Another way in which the "digital divide" manifests itself is through geography. The primary gap is a rural-urban split in terms of the availability of infrastructure necessary for access. Urban residents have many more options available to them compared to their rural counterparts. These options can range

from DSL Internet access to public access through the public library systems. Gordon, Dorr and Gordon (2003) provided evidence of this disparity in the Navajo Nation pointing out that in this Nation of 180,462 people living on 26,867 square miles of land, there is only one public library. Barack (2005) found that the gap would not show any signs of decreasing as long as rural areas have little or no access to broadband connections. While programs like the E-rate program have been put in place to fund access to broadband Internet in rural areas, these programs come with filters attached to software that again limits the users access (Barack, 2005). The filters are designed to block access to websites that contain material that the government views as offensive or dangerous (Barack, 2006). This type of filter is understandable, however, this also means that students will not be able to access sites that deal with such topics as anti-smoking, anti-violence or sex-education sites (Barack, 2006).

The geographic divide can also be seen on a global scale as well. The major gap exists between the developed and developing countries. The following table shows that the gap is evident between developed and developing countries. It can be argued that this gap is a result of the emphasis developing countries put on providing the basic survival needs to the citizens of the country. Considerable resources would be needed to close the “digital divide” in those countries.

Table I. Broadband connections to the Internet Globally (from Cullen, 2001, p.315)

Country	Date	Number	Percentage of Population
Canada	Dec 1999	13.28 million	42.8
USA	Nov 2000	153.8 million	55.83
<i>Europe</i>			
UK	Nov 2000	19.98 million	33.58
Sweden	Nov 2000	5 million	56.36
Norway	Oct 2000	2.36 million	52.6
Ireland	Nov 2000	1.04 million	27.5
France	Mar 2000	9 million	15.26
Germany	Nov 2000	20.1 million	24.28
Spain	Nov 2000	5.49 million	13.72
<i>Middle East</i>			
Israel	Jul 2000	1 million	17.12
Jordan	Mar 2000	87,500	1.92
Lebanon	Mar 2000	227,000	6.39
<i>Africa</i>			
Burundi	Jul 2000	2,000	0.03
Egypt	Mar 2000	440,000	0.65
Mauritius	Jul 2000	55,000	4.66
South Africa	May 2000	1.8 million	4.19
<i>Asia/Oceania</i>			
Australia	Nov 2000	8.42 million	43.94
China	Jul 2000	16.9 million	1.34
Japan	Nov 2000	38.64 million	30.53

The final manifestation of the “digital divide” is the age gap. While this area appears to be decreasing the gap can still be seen as significant. Servon (2002) found that seniors, aged 55 and older, had the lowest access rate of only 22 percent. Members of this age group are primarily motivated to stay connected to friends and family, in comparison to the younger age group who obtain access primarily for school or work (Servon, 2002).

Further to this, Callison (2004) believed that the age gap would have the greatest impact as time goes by, a result of teens becoming technologically literate at a rate much faster than their adult educators. There are many reasons why this gap is widening. First, school divisions often limit the professional development in this area, causing teachers to train themselves (Callison, 2004). Second, teachers are often not given sufficient time or resources to develop professionally. Finally, there is a portion of the population that is not motivated learn new skills despite not having reached retirement (Mossberger, Tolbert and Stansbury, 2003).

Case Studies

The question then becomes, “How can we begin to close this divide and give people greater access to technology?” Several programs have been in place for a long enough period of time to show promising results. Other programs are in their infancy. There is also the problem that divisions may be introducing technology to students in attempt to solve problems that are not caused by a lack of technology.

One case study involves a program introduced by the Gates Foundation in the southwest United States (Arizona, Utah, Colorado and New Mexico) (Gordon, Dorr and Gordon., 2003). The Foundation has labeled their project the Native American Access to Technology Program (NAATP). The objective of the program is to provide technology and access to the Aboriginal people of the southwest (Gordon, Dorr and Gordon., 2003). Gordon, Dorr and Gordon (2003) stated that the foundation is proud to provide “packages” rather than just

computers. These packages consist of hardware, software, installation, training and ongoing technical assistance (Gordon, Dorr and Gordon, 2003).

The program came about as a result of much discussion between elders in the Nations and the Gates Foundation (Gordon, Dorr and Gordon, 2003).

There were fears that increased access would widen the existing gap between adolescents and elders and increase the chances of these students becoming further removed from their ancestral roots (Gordon, Dorr and Gordon., 2003).

These fears were somewhat alleviated when the Foundation offered to include in the “package” two Navajo language programs and a year’s access to ProQuest’s Ethnic NewsWatch, which would provide the users access to online Native publications (Gordon, Dorr and Gordon., 2003).

A second challenge came with the issue of connectivity. Given that only 34.7 percent of the homes in these nations had phone lines, connecting the people would not be an easy task (Gordon, Dorr and Gordon., 2003). The Foundation decided to approach each Nation on an individual basis to determine the best strategy for each one. Options that were discussed ranged from wireless or satellite connections and extending existing communication lines in Nations close to large urban centers (Gordon, Dorr and Gordon., 2003). The result of these negotiations has lead to 43 Nations now participating in the NAATP program (Gordon, Dorr and Gordon., 2003). The “packages” have been installed in 161 locations in the area, 21 of which are libraries and 100 received satellite connections to obtain their access (Gordon, Dorr and Gordon., 2003).

The case study then provides an initial assessment of the program while waiting for further data to be returned. Initial feedback has celebrated the success of the program while maintaining a critical viewpoint of future data:

- A dramatic increase in computer and Internet access in the Nations.
- Technology in some areas heavily utilized, especially by children.
- Equipment that was once unaffordable is now in the hands of people who would otherwise not have access.
- Foundation has better understanding of how to respond to situations similar to these.
- Increased partnerships between Tribes and other agencies.
- Increased training and education for those wanting this.
- Excitement about what opportunities may arise for members (p. 432).

From a society that has been marginalized throughout history, this opportunity is bridging the gap that may lead to increased opportunities. This program attempts to bridge the gap on a socio-economic level, a geographic level and an age level.

Kuttan and Peters (2003) offered several examples of programs put in place to bridge the gap in the “digital divide”. The Boston Computer Clubhouse is a program put in place to aid underprivileged youth by giving them after school access to technology. The center was created as a result of a partnership between the Boston Computer Museum and the MIT Media Laboratory (Kuttan and Peters, 2003). The goal of the project is to not just give these students access to games and entertainment; rather, the emphasis is to teach the students how to use various programs created for publishing and design, preparing them for entrance into the workforce (Kuttan and Peters, 2003). The program will focus on individual interests and not follow a set curriculum to allow

the children the chance to explore application in areas of personal interest (Kuttan and Peters, 2003).

While the previously mentioned goals are instrumental in the success of the program, the center has an underlying motivation to build a community among the users of this program. Students are able to build relationships with members of the adult community in a safe and educational setting (Kuttan and Peters, 2003). This is achieved through the design and layout of the center. Computers are not placed in rows with an instructor at the front, but are arranged in pods around the room with a common area in the center giving the students a sense of community in an environment shared with adults (Kuttan and Peters, 2003). The center brings in members of the community in order to build the youth-adult relationships that are a fundamental goal of the program. The highlight of this program is the “Clubhouse to College/Clubhouse to Career” program (Kuttan and Peters, 2003). Designed to aid students in planning their future, the program brings the students to the community through field trips, job shadowing, and professional internships giving them the chance to build relationships that will benefit them later in life (Kuttan and Peters, 2003). This is another clear example of how large corporations have recognized a problem and have taken steps to combat the problem and address the needs of the future. Once again the focus of this program is to bridge the gap on a socio-economic level and perhaps the age level.

Implications of Not Bridging the Gap

Throughout history have been several examples of gaps existing between the “haves” and “have-nots” in society, yet there seems to be a sense of urgency to close or at least narrow this technological divide. Perhaps this is due in part to the technology explosion that has taken place over the last decade. Employment and education will almost certainly require technological skills of the members in order to keep pace with other organizations around the world. One would be hard pressed to find an example of employment where some technological skill is not required. Eamon (2004) has explored this idea and has created a list of possible implications for those people who are unable to access and become familiar with technology.

Eamon (2004) identified four main categories of implication that need to be addressed to avoid disruption later on in life: “a) educational advantages, b) future employment and earnings, c) opportunities for social and civic involvement, and d) equity and civil rights issues” (p. 92). The basis for the research that Eamon (2004) conducted was the belief that the Internet will offer a number of educational advantages to those that have access. Eamon (2004) argued that information technology (IT) provides educators and students with a large body of information at their fingertips. Studies found that 74 percent of parents believed that children without access to IT are at an educational disadvantage (Turow & Nix, as cited in Eamon, 2004). This would then lead to those without access being left behind as others progressed. Louie (2005) argued that a growing number of school activities and assignments are tied to IT

access and therefore those without this access are increasingly at a disadvantage. Students with no access at home must have the assignments completed before leaving the building for the day.

While DiBello (2005) would support Eamon's belief, the issue of training and support for educators must be raised. Just because teachers and some students have access to this IT, does not mean that it will be used effectively. Teachers expect the division to supply them with professional development programs to stay current with IT. Technological support is another potential problem. Hardware and software will inevitably have support issues that must be met in order to maintain the access that educators are striving to achieve (DiBello, 2005).

The second area of implication as identified by Eamon (2004) deals with future employment and earnings of students with access compared to those with limited or no access. IT can help students in prepare for employment and to research employment. More than three-fourths of adolescents surveyed feel that IT is critical to future employment (Gallup Organization as cited in Eamon, 2004). Experience has shown that if given a choice, employers will generally chose those candidates that have IT skills as this will benefit the employer in the future. Dibello (2005) would also argue that employers often pay more to an employee who is already trained technologically as this will save the company the cost of training.

Further along this line is the availability of future employees. Kuttan and Peters (2003) found that by the year 2008 there will be a need for an additional

1.7 million computer engineers, programmers and analysts. Given the current state of the divide, a large number of capable individuals will be at a disadvantage because of their lack of IT skills. Kuttan and Peters (2003) pointed out that policy makers today would rather look outside the United States to find the skilled laborers needed and have gone as far as creating a “H-1B visa designed to bring in high-tech workers from countries like India, China and Taiwan” (p. 23). If the divide continues for an extended period of time, then those on the “have-not” end of this divide will run the risk of having their job future predetermined because of their lack of access (Louie, 2005).

A third issue raised by Eamon (2004) is the limitations imposed on opportunities for social and civic involvement. The Internet has transformed communication and access to information that can be reached. One can explore civic policy through governmental sites and meet people thousands of miles away with the click of a mouse. Socially, an adolescent who has no access to IT will face disadvantages that their peers with access will not have to face (Eamon, 2004). Those with access have the opportunity to keep abreast of current events through access to numerous newspapers and news media outlets via the Internet (DiBello, 2005). This enhances their citizenship as they become more informed about the world around them and increases their connection to their society.

The final issue raised by Eamon (2004) models an existing situation that has been taking place for as long as there have been organized societies - equality and civil rights. A closer look at the socio-economic component of the “digital divide” shows that the gap is primarily between those of European

ancestry and visible minorities such as African-Americans and Latino-Americans (Eamon, 2004). Warschauer, Knobel, and Stone (2004) supported Eamon and this theory stating unequal access to IT will only further the marginalization of those who are limited in their access to technology.

Strategies Designed to Close the Gap

Many solutions can be offered, but unfortunately only time will tell if they are successful, and for some that will be too late. Some feel that simply increasing the access will solve the problem. Some believe that governments need only to increase funding so that technology can be purchased to give those without access, increased access to IT. Unfortunately neither of these options will close the gap significantly. Several solutions will be looked at and evaluated to determine whether or not this situation can be reversed.

DiBello (2005) stressed the need for all involved to make the commitment to improve access to IT. The weight falls on to the shoulders of administrators, teachers, parents, and students to improve access and to then use the IT to the fullest and best of its ability (DiBello, 2005). A school system must keep long-term goals in mind when arranging for technology to be purchased and maintained in the school environment (Dibello, 2005). This is an important consideration given the rate that technology advances in today's world. Planning for obsolescence of hardware and software is important, and includes consideration of maintenance, repair and replacement budgets.

Louie (2005) offered several solutions designed to bridge this gap. The strongest of these options appears to be the Hillsboro, Oregon “2020 Vision Statement”. This program calls for organizations to;

“Promote and expand extracurricular, after school programs for students to assure structured, wholesome activity for youth; create new entry level jobs and apprenticeship opportunities for youth, minorities, low income residents; create more outreach from public safety organizations” (p. 63).

This statement encourages organizations to evaluate their current practice to see if it would fit into the parameters set out by the city. Using this, the organizations would be able to identify those neighborhoods where access is needed most and establish programs to address the needs (Louie, 2005).

A strategy being explored by the Gates Foundation will attempt to bridge the gap between rural and urban public libraries (Barack, 2005). Government officials see the public library as the cornerstone of public right to access (Cullen, 2001). Programs must be put in to place to try to expand the broadband network to include small rural communities to increase the access in rural areas. A problem occurs with telecommunication companies not entirely willing to use financial resources to expand the network to an area that may not provide a return on their investment. The Clinton administration proposed a seven-point plan designed to eliminate the “digital divide” (Cullen, p. 318, 2001)

1. tax incentives to encourage private sector donation of computers, and sponsorship of community technology centres and training centers;
2. funds to train all new teachers in the effective use of IT;
3. funding for community technology centres in low-income rural and urban areas;
4. public/private partnership to expand home access to the Internet for low-income families;
5. promotion of innovative use of technology for under-served communities;

6. subsidies to accelerate private sector extensions of broad-band networks in under-served communities;
7. funding to help prepare Native Americans for careers in IT.

While the plan is a positive step, it does not meet all of the needs of those members of the population who have limited access to technology. Shortly after this plan was proposed, a change in the administration and world events shifted the plan to a lower priority.

Another program that was created to meet the needs of those with limited or no access is the Community Access Program (CAP) present in Canada. The program is the creation of Industry Canada and is designed to provide people with affordable public access to the Internet and the skills needed to use it (Cullen, 2001). These programs can be found in libraries and schools in rural and urban areas throughout the provinces.

Blau (2002), however, argued that simply purchasing and placing more technology in the hands of those in need would not bridge the gap. In order to best tackle the problem, Blau (2002) feels that a life preserver philosophy must be employed. The problem must be surrounded in order to maintain the support, much like the Gates Foundation Program, which included not only the hardware but the technical support as well (Gordon, Dorr and Gordon, 2003).

Masson and Dodds (2005) proposes several solutions to close this divide such as; wireless networks, electronic portfolios, portable technologies, attractive technologies and virtual schools. It is believed that if these plans are put in to place in elementary schools then the gap can be narrowed within the next generation (Masson and Dodds, 2003). The goal is to increase access to all

those involved, and particularly those with disabilities that limit their access (Masson and Dodds, 2003). Of course these types of initiatives require cash flow to see them come to fruition. The challenge then is to ensure that any monies spent are spent wisely (Masson and Dodds, 2003).

Conclusion

The evidence clearly shows that the “digital divide” is prevalent, despite efforts to close this gap. While this discussion touched on some of the issues facing society today, it is not a comprehensive list. For every gap that appears to be narrowed, another widens, creating more challenges for educators and governments. The success or failure of programs designed to bridge the gap will not be effectively evaluated for years to come, and all the while technology will continue to evolve.

In addition, it will take a significant paradigm shift to put an end to the social stratification that is a leading cause of the “digital divide”. The class system and perceived ideals of those in each class, will constantly keep those at the lower end of the economic spectrum from increasing their access to technology and the Internet. Given time, the age gap is the most likely candidate to be bridged. As generations move from one to the next, the older generations will be replaced by those younger techno-files who have grown up in a computer rich environment, closing the age gap at a steady pace.

It is clear that there are fundamental implications for our youth if this gap is not bridged. The many social and learning implications should provide

appropriate motivation to administrations to create even more programs designed at closing the divide.

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