THE DIGITAL DIVIDE IN EDUCATION[1]

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Introduction

There is a global discussion (Pearson, 2002; BBC Special Report, 1999; World Telecommunication Development Report, 2002) concerning on the issue of the haves and have-nots. Most research on the subject (Bolt & Crawford, 2000; Mack, 2001; Pearson, 2002) has covered what has come to be known as the "digital divide", or the separation between those who have access to, and can effectively use technology, and those who do not. Despite the sharp rise in telecommunication access in the developing nations, the global digital divide is getting wider (World Telecommunication Development Report, 2002). Providing public access to the Internet gives definite groups the opportunity to advance by providing them with technical skills which are needed to compete in the digital economy (Pearson, 2002). Those who have access to technology are being afforded more opportunities than ever before, but one must also think about what happens to those being left behind. One should also ask how big the growing gap between the information rich and information poor is, why is it so hard to close, and how are individuals and communities around the globe trying to bridge the digital divide.

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The issue of the digital divide is of highest concern in the United States Government and commerce. This concern involves the US Government Working Group on Electronic Commerce, The National Economic Council, The White House Office of Science and Technology Policy, The National Science Foundation, The Department of Education, and The US Department of Commerce. Besides governmental organizations, financial institutions are also interested in the digital divide (Gaillard, 2001).

It is easy to understand why corporate America is concerned with the divide that because it affects Internet access, which is simply a marketing issue (Cuban, 2002). However, an important question for this study is what makes the digital divide such an important issue for the government.

By considering all the questions asked above, this study examines the digital divide at three different levels: a) from the perspective of the US as the most powerful country in the World, b) from a global perspective and c) from the Perspective of Turkey.

After defining the term "digital divide", I look at the digital divide in the context of the US, mostly focusing on education, and partly race and gender. However, approaching the issue from only the United States' perspective is not enough because the digital divide is not only an American issue but also an international one. Digital gaps in education, employment, race, and gender have already become worldwide issues and the educational divide is getting wider between developed countries and developing countries, between cities and rural areas, and between the rich and the poor. Therefore, another purpose of this study is to look at the problem from a global perspective and to figure out the third-world situation. The purpose of doing that is to gain an insight into how wide the divide is between developing countries (the third world) and the most

developed country, the US. As a third word country, Turkey has a special place in this study because it is representative of developing countries. Finally, I deal with the solutions to close the gap focusing especially on the question of what should be the role of education and what should be the role of teachers in closing the gap.

WHAT IS THE DIGITAL DIVIDE?

What is the digital divide? How is it perceived differently? Are there any differences in the perception of the term among various social groups, economic groups, and cultural groups? What makes it different from ethnic or racial issues as well as issues of wealth vs. poverty?

The digital divide phenomenon is not exactly new. In the late 1980s and early 1990s, it was fashionable to talk of the information rich and the information poor. Then along came the public Internet, which helped make visible the information gap between the "haves" and the "have-nots" (Cronin, 2002). Measurable differences in ownership of computers, access to information technology, and baseline indicators of Internet-connectedness have powerfully illuminated the gap between elite and marginal groups, both within and across societies. They bring the rhetoric of info rich/info poor clearly to life, helping to get the issue of distributive unfairness on the radar screens of the people who supposedly matter (Cronin, 2002). Consequently, the term digital divide refers to unequal access to information technology.

However, public debate has addressed the digital divide as a technical issue rather than as a reflection of broader social problems (Light, 2002). Therefore, to understand the digital divide, the forces influencing it must be considered. “Every social situation is

affected by five general categories of forces; society, technology, economics, politics, and the environment (Mitchell, 2001 p. 4). Thus, some believe the digital divide is explainable by income, education, and location or that "digital divide is the line that separates those who have computer access, along with corresponding skills and use the Internet, from those who neither have access to computer technology nor the Internet" (Gaillard, 2001).

Digital divide is a term increasingly used to explain the social implications of imbalanced access of some sectors of the community to information and communications technology and to the achievement of necessary skills (Cronin, 2002). Access to computers and the Internet, and the facility to effectively use this technology, are becoming increasingly important for full participation in economic, political, and social life. Access to online technologies is a necessary requirement for ensuring equity in access to the information economy, for enabling governments to achieve electronic service delivery objectives, and for allowing people to capitalize on the opportunities for economic growth offered by the information age (Cronin, 2002).

Overall, from my point of view, the digital divide is a social problem that is caused by inequalities in the ability to access and to use information communication technologies. I would say, therefore, the digital divide is a threat to social and economic justice as well as to education.

The Digital Divide in Education

As I have already indicated at the beginning of this study, there is a digital divide occurring on every possible level: locally, nationally, and globally. Now I would like to focus the problem in terms of education.

Schools have always been seen as a panacea for any social problems by different social groups such as policy makers, educators, and parents (Perkinson, 1968; Beaty, 1995; Cuban, 2002). Thus, it is not surprising that schools are being seen as a solution to close the digital divide today. Many people think that schools can serve to help bridge this divide in many of our classrooms (Cohen, 2002; Cuban, 2002; Bolt & Crawford, 2000), but they miss an important point that if the problem has already taken its controversial places in such as urban vs. rural, private vs. public or large vs. small, how can every school in different settings help bridge the divide?

Looking at traditional school polarities in the US: rural vs. urban, girl vs. boy, and white American vs. African American, Latino, Indian, or other minority groups, one might wonder whether the digital divide is a new version of the discrimination. Since the colonial period there has been a reality of racial, ethnic, socioeconomic, and gender discrimination occurring in US schools (Spring, 2000). Most interestingly, since the common schooling period, it has been believed that the schooling would eliminate the problems of the unequal distribution of property by increasing the general wealth of society and consequently, improving the economic conditions of the poor. But one should ask: why is the divide still out there, what has been done to close the divide?

The technological disparity or inequality between the US schools caused many proposals to help close the divide by both governments and private entities. For instance, the US Department of Education developed several technology projects aimed at increasing the effective use of technology in the nation's elementary and secondary schools (Mack, 2001). To help bridge this educational technology gap, in 1996, the Clinton administration made $2 billion available for five year grants from the Technology

Literacy Challenge Fund (Cuban, 2002), and announced four National Technology Goals in the area of education and technology. The goals[2] are:

- Teachers will have the training and support needed to help students use computers and the Internet to learn
- Classrooms will have modern multimedia computers
- Classrooms will be connected to the Internet
- School curricula will use software and online learning to ensure that no child is left behind

The Universal Service Fund, commonly known as E-Rate, is another significant program[3] to meet the goals stated above. The objectives of the program are to provide all public and private schools and libraries access to affordable telecommunications and advanced digital technologies, and to assist schools with limited budgets to acquire these services at reduced rates, especially discounting the cost of wiring classrooms to the Internet in schools with high percentages of low-income students[4].

The E-Rate program allows eligible schools and libraries to receive discounts ranging from 20 to 90 percent, depending upon economic need and location (urban or rural). These discounts are available on eligible telecommunications services, which include basic local and long distance telephone services, Internet access, and acquisition and instillation of equipment to provide network wiring within library and school buildings. Although computer hardware and software are not included in the program, the hope is that schools will utilize the extra savings afforded by the E-Rate program to fund

[2] U.S. Department of Education, 1996
[3] Authorized by the Telecommunications Act of 1996
[4] For example, in 1981 there were 125 students per computer in US schools. A decade later, the ratio was 18 to 1. By 2000 it had dropped to 5 students per computer (Cuban, 2002).

these acquisitions. Since acquiring computer technology and services is only the first step toward establishing a digital classroom, the E-rate program application requires schools and libraries to develop a detailed plan to integrate technology into the curriculum once the equipment and services are installed (Mack, 2001).

To date, research on the effectiveness of the E-Rate program has determined that the discounts have in fact allowed school districts to achieve faster deployment of computer networks and Internet access and reinvest the savings in other important technology needs (Mack, 2001). During the last two decades, the role of the computer in American schools has extended as its capacity as a learning tool has changed, and it has increasingly become an integral part of daily classroom life. In particular, the Internet has exposed students to topics that they could previously only find in textbooks or at the library, has enabled teachers to enrich their classroom instruction, and has provided increased opportunities for teacher professional development (Puma, Chaplin and Page, 2000).

The importance of the Internet can be appreciated by rural and isolated students as it allows them to learn outside the regular classroom. Educators can also communicate with their colleagues in the United State and around the world via the Internet. Students with "the click of a button" can explore information that once would have required extensive library research or may have been totally unavailable to them in their school or local library[5].

[5] In terms of what technology can mean for students, the E-Rate study discusses two separate studies that examined the impact of computer technology in rural and low income classrooms. One study discovered that in very disadvantaged schools, technology enhanced student motivation and learning. Similarly, the second study determined that the use of technology improved students' basic math and reading skills and resulted in small positive increases in test scores, particularly for rural and low-income children(Puma, Chaplin and Page, 2000).

Although computer technology is an essential and important component of the modern-day classroom, the E-Rate Study admits that current efforts to integrate technology in the classroom are limited by the same socioeconomic realities that have played a role in creating an impoverished school system. That is, while all public schools are equally likely to have Internet access in at least one room, getting access at the classroom level where it can be incorporated into daily instruction has been more of a challenge. As might be expected, the percentage of classrooms with access is divided along wealth lines, with 74 percent of the wealthiest schools likely to have classroom access while only 39 percent of the poorest schools have similar capabilities (Mack, 2001).

When examining the overall goal of the E-rate program, to assist schools in low income communities and rural areas in obtaining technology services, initial data on fund distribution indicate that indeed the program is achieving that objective. In the first year of operation, the most severely impoverished school districts had somewhat lower application rates than might have been expected. However, in the second year of the program, the application rate for this category of schools rose. Moreover, in terms of real dollars allocated to minority students, more than $800 million have been committed to districts with 50 percent or more minority students (Mack, 2001; Puma, Chaplin and Page, 2000).

Nevertheless, as it makes strides toward narrowing the digital divide in the classroom, the E-Rate program may still be unable to reach some of the nation's smallest and poorest schools. Critics of the program contend that the bureaucratic requirements and mandatory financial outlays make it impossible for some schools to participate in the

program even if they are given a 90 percent discount on the services covered by the E-Rate program. It is simply a matter of not having the necessary staff to gather the information required for the detailed application process. For others, amassing the 10 percent co-pay constitutes an excessive financial burden when coupled with the outlays required to update their infrastructures in order to take advantage of the technology.

Corporations have also offered technology assistance and training to help bring poor school districts into the digital age. For instance, Microsoft targeted low-income school districts with the message that they can save money and time by implementing an integrated Microsoft software system (Mack, 2001).

By considering both governmental and private supports and programs, it was hoped that states will eventually make financial commitments to fill the void for the most poverty stricken school districts in order to ensure that no child is left behind in the digital revolution (Mack, 2001). But the recent governmental explanation[6] does not approve that optimistic approach.

However, even if the presidential promise to wire every school (Bolt & Crawford, 2000) makes more sense now, that promise does not address the real issue[7]. Let's assume for a moment that technology is integrated in the smallest and poorest school in every school district of the US. Does it mean that the problem is solved? Of course not.

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[6] President Bush's budget plan, released Feb. 4, would eliminate a $62.5 million effort for preparing teachers in the use of technology. His proposed fiscal 2003 budget would also slice $32.5 million from the Department of Education's budget for community technology centers—small, community-based groups that provide Internet-connected computers, software, and training to low-income individuals, including many students who could not afford them otherwise. (Trotter & Hoff, 2002).

[7] During his campaign for the presidency, George W. Bush commendably stated that one of the most important next steps in closing the educational achievement gap was to bring technology to communities. He proposed to build 2,000 new community technology centers a year (Dickard, 2002)

Mere access is not enough. If you're going to give schools computers, you also need to offer constant technical support, upgrades and training for teachers, not only in how to use the computers, but also in how to usefully integrate the technology into a meaningful curriculum. On the other hand, a fear of science and technology may hinder some students, and even some teachers, from immediately embracing technology. Furthermore, a lack of financial resources at home may prevent some from purchasing personal computers to assist in research and other class assignments during non-classroom hours. Thus, like most social issues, the problem of integrating technology into school district classrooms is multi-faceted and will not be resolved by simply throwing dollars at the issue.

In addition, although there are many attempts to understand how much of the population has access to the internet, many people miss an important point on this issue. That point is not simply to understand or figure out the percentage of the people who have access to the Internet, but the point should be to understand what people are doing or what they are able to do when they go online[8].

I S THAT THE SAME ABROAD?

There is a big debate around the world whether technology has benefited society and how it will affect society in the future. This can also be viewed from the opposite perspective. Has technology harmed society (Mahon, 2002)? Has technology improved

[8] In August 2000, 58 percent of U.S. households had Internet access. In the same month, 116.5 million Americans were online at some location. Certain sections of society that have traditionally been unable to access digital technology (e.g., low-income groups, ethnic minorities, women) are now making spectacular increase, though some others, notably blacks and Hispanics, remain underrepresented even after income and educational differences are factored into the analysis (Cronin, 2002).

society (Raman, 2002)? Has technology created a digital divide (Revenaugh, 2002)? Has technology not created a digital divide (Cohen, 2002)? Employment is reorganized differently in the various corners of the world; race and gender gaps are emphasized by educational, social, economic, and political issues. Many people argue that the digital divide unfairly equips wealthy citizen and their children with more information and opportunities than those with lower incomes (Ojeda, 2002).

There is an imbalance in the quality of Internet access available around the world (Roach, 2002). Outside the US, even in some relatively advanced nations, (Rao & Klopfenstein, 2002) the gaps are still quite striking. In Britain, it is estimated that more than 60 percent of the richest ten percent of the population have household access to the Internet, while only about six percent of the poorest ten percent have online access. Once we move to the third world, the digital disparities are unbelievable; most people don't even have a phone, let alone an online connection, either at work or home (Cronin, 2002).

Most of the world (80% of the world's population) still does not have a telephone, and 90% of Internet users are in OECD (Organization for Economic Cooperation and Development) countries. There is also a digital divide between businesses, those that have access to the most sophisticated technology and those that do not (Donogue, 2000).

There are about four million Internet users on the continent of whom 2.5 million are in South Africa. In Africa, one in every 200 persons has Internet access, compared with one in 30 globally, and one in three in advanced economies (Jensen, 2002). It is in this context that the concept of a digital divide still has considerable mileage, and one can

but hopes that the policy experts won't lose interest in the subject once domestic inequalities begin to be eradicated.

In China, statistics (CNNIC, July 2001) show that 38% of urban Chinese have telephones, and only 12.5% of rural Chinese can telephone access, the gap of Internet access is much wider. 61.3 % of Internet users (CNNIC, July 2001) are male and 38.7% of them female, 37.5% of internet users are high school educated or under, and 62.5% of them have college education or above.

Many Asian countries are achieving remarkable success in closing the digital divide between developing and developed nations, while others continue to struggle. Although the USA is the leader, Asian countries have been recording high growth rates in computer related industries ("The Global PC Market", 1996). However, although the Internet was a 1990's phenomenon, some Asian countries have been slow to adopt the Internet and the level of Internet diffusion in Asia is lower than in the US and Western Europe (Madhavan, 1998; Mesher, 1996). Besides that, Internet access in most Asian countries is mainly limited to governmental, organizational, and educational institutions and businesses even though the number of individuals with access is increasing. The diffusion of computers and modems remains low and the cost of these technologies is high (World Telecommunication Development Report, 1998).

Regarding to education, all nations seem to be struggling with how to provide all children equal access to, and services within the education (Mazurek, Winzer, & Majorek, 2000). The international community is well aware of the problem for developing countries, but industrial countries are also struggling with a widening gap between groups at different educational and income levels, raising fears that entire

sectors of society may be excluded because of their inability to use, or afford information and communication technology (James, 2001).

How About Turkey?

To understand the issue of the digital divide in Turkey, we need to look at it from different perspectives, such as social (demographic, gender: men vs. women, education: private vs. public), geographic (urban vs. rural), economic (rich vs. poor) and political. Therefore, my main questions can be listed as follows: 1) How wide is the digital divide in Turkey? 2) How do Turkish people perceive the meaning of the digital divide? 3) Are there any differences in the perception of that term among the various ethnic, religious, social, economical, linguistic and cultural groups? 4) What makes the digital divide different from ethnic or racial issues as well as issues of richness or poorness? 5) How big is the growing gap between the information rich and information poor in Turkish education? 6) What are the Turkish government and private institutions doing to close that gap? 7) What is the relationship between having power and having technology? 8) What should be the role of education and what should be the teachers' role to close the gap? 9) How can European Union (EU) be helpful on this issue?

The digital divide in education represents a growing phenomenon that shows no signs of narrowing worldwide. Within this global context, Turkey may present a worthwhile case for trend comparisons in different parts of the world. The importance of Turkey comes from its geo-politic and strategic situation, culturally diversity and its

historically rich status. These aspects of the country make it an ideal candidate for becoming key player[9].

Social and Educational Issues: Turkey is a country with a large population of 70 million and a high birth rate. Each year, about 1.300.000 children enter the elementary schools, and the demand for education has shown a tendency to increase. The national education system has been overly pressured to handle this demand. Overcrowded classrooms, teacher shortages, and also inadequate allocation of instructional resources are just a few issues. Massive migrations from rural to more developed areas have made it difficult for the MOE (Ministry Of Education) to plan educational facilities. Some village schools have been closed because there are no students left; in others more than 80 to 100 students have to be trained in integrated classrooms, with three or five grade levels sharing one room and a single teacher (Akarsu, 2000 p.323).

However, in the private schools, the situation is very different, and at first glance, one can easily see the difference between public and private schools. Normal class size is around 50 in public schools, whereas the number in private schools is around 20. The divide is not only with the number of students but also with the quality and quantity of education. For instance, although almost all the private schools have technological equipment (Computers, TVs, VCRs, and Projectors etc.) in every classroom, the public schools do not have enough equipments because Turkey is one of the few countries that allocate a minimum of its financial resources to education (Akarsu, 2000).

[9] In international political theory, it is claimed that a country's power and position within the global system depend largely on its geographical position. Turkey, a country with a portion of its land in Europe and a larger part in Asia, is located between the East and West. It has been acting as a geographic, historic, and cultural bridge between them for centuries (Muftuler, 1997).

Gender Issue: Turkey is an interesting example from the perspective of women, because it is a country that is influenced by all the contradictions of globalization and traditions. The illiteracy rate is the most significant indicator of gender inequality in Turkey. Despite the sharp decline of the illiteracy rate, one third of Turkish women remain illiterate (Turkish Women in Statistic, 1994). Regarding the digital divide, it is likely worse than the illiteracy rate. Turkish women have not yet integrated the Internet into their lives because, among those women who are not illiterate, many of them either do not know how to use the Internet or do not have the means to access it. Those who regularly use the Internet engage mostly in e-mail and research (Sevdik & Akman, 2002)

There are still inequalities between women and men and also between women from different sectors of society, in accessing important development sources, such as education, health, and employment. The inequality of the genders in the educational field directly affects the opportunities for the employment of women. Although a consensus of opinion has been reached concerning the importance of women's participation in the labor force in Turkey, problems still continue in practice. The participation of women in the labor force is low. According to the 1998 data, this ratio is around 28 percent. The great majority of women within the labor force work in the agricultural sector as non-paid family workers.[10]

Political issue: Turkey, with the help of economic, social, and the other structural reforms, has promoted itself closer to the level of developed countries, as opposed to developing countries. These reforms will have long-term benefits, among them a better educational system as well as a decrease in the problems of the digital divide. In spite of

[10] From the Web Site of Turkish Foreign Ministry
http://www.mfa.gov.tr/

the variation between districts parallel to urbanization, the modernization of the telecommunications structure in Turkey, starting from 1980's, is a sign of the evolution of The Information Age in Turkey. The up-to-date digital switching boards and daily expansion of the digital mobile GSM network of Turkey are promising guarantees of Turkey's ability to prove its competence and skill in the telecommunications sector. In comparison with the rest of the developing and developed markets of the world, Turkey is a leader in investing in the telecommunications infrastructure per GDP. With 19 million PSTN subscribers and approximately 19 million GSM subscribers, the telecommunications access paths per one household are 2.6 (260lines/100households), which is one of the highest rates in the world (Vural, 2002). Unfortunately, the success of investing in the telecommunications infrastructure has not been carried into the public schools by the government in terms of the Internet access.

The media is an important power in controlling the politics of a country. This is especially true in developing countries where there are some strict rules about what you can and cannot say because such governments either do not want you to criticize them or they do not want to lose their power. Turkey is one of these countries, and at this level, the Internet has a really important role in giving people the use their freedom. Many Turkish Internet pages are extremely critical of politicians and run stories that television and newspapers dare not print. It means that the Internet is one of the strongest solutions to erasing the cartel of media. However, many in the Turkish Internet industry are warning that there could be chaos now that the government introduced new controls forming part of a new broadcasting law that has just come into force. But the government

has dismissed such concerns, saying it simply brings the Internet into line with the rest of the Turkish media.

Superonline, with around a million subscribers, is one of the most popular Internet providers in Turkey, and part of the country's rapidly growing Internet sector. One of the reasons for that growth is that the Internet has so far been exempt from Turkey's strict and extensive laws on broadcasting. But that has just changed. The Internet has been included in a new, wide-ranging broadcasting regulation[11], and its future could be at risk (Savas, 2002).

> "There's not going to be freedom of speech, and this is going to impact the local content and local hosting services, and eventually the whole Internet sector. It means you have to bring a copy of your website whenever you're updated to be approved by the local authorities, which is quite impossible to implement. They might easily put me and my chairman out of business, and eventually they might to decide to close down my portal and my business. But I don't think they will do this because there's going to be havoc and protests from the whole sector" (Savas, 2002).

A lot of people in Turkey realize that Turkey must not make the same mistakes made by the Ottoman Empire 200 years ago that caused it to miss the industrial revolution, which left them unable to catch up with the times and compete with other countries. Now Turkish people, especially young people, have a firm belief that the

[11] The regulation requires websites to submit two hard copies of pages to be posted on the Internet to a government agency for approval. In addition, websites would not be able to launch without approval from local authorities. If permission to launch a website is granted, the owners would then be obligated to inform the authorities every time the site is changed. The regulation comes at a time when Turkey is struggling to meet human rights and civil liberties requirements for European Union membership.

Internet and computers in general, will provide them a second chance. A new train has arrived. Whether they get on that train or not is up to us, and the younger generation seems strong-minded enough to do that. Unfortunately the older generation and politicians do not seem to be of the same mind (Sahin, 2002)

SOLUTIONS TO CLOSE THE GAP

The digital divide is a very complex problem that manifests itself in different ways in different social backgrounds and different cultures. Therefore, the solutions must be based on an understanding of local needs and conditions, and integrating technology into society in an effective and sustainable way.

There is a general opinion that education is the main tool through which something can be done to resolve the digital divide. It needs to include not only the children of the community but the parents as well, since education really starts from home and a lot of boost for learning needs to come from home. It must also be introduced into the prisons where good parts of the community (especially in reference to low-income American neighborhoods) spend their time. New systems need to be developed where the computer can be used for its educational capabilities since technology in itself is meaningless unless designed for an application (Bolt & Crawford 2000). In this way it can be used to teach and strengthen existing concepts. It can play a very special role as a resource for inquiry and invention at the child's own pace and in his own space. This also looks into the aspect of the special needs of some children whose life is already moving at a very fast pace and who hence need to slow-down a bit in their own learning process.

Let's create scenarios in which we have two different types of students in economically, socially, and culturally different districts such as urban, rural, and suburban. The worst case scenario is that both students are going to the poorest school in the district and both have a low income level family in a diverse community where African-Americans, Latino Americans, and native-Americans are the majority. The school they are attending has no computer because of a lack of resources. The students are not willing to go to school because they do not believe that school will be helpful to their life in the future because their community and culture promote such a view. They have not even heard that wireless information transfer is possible from the many libraries around the world while sitting at home or school with an Internet accessible computer.

On the other hand, let's assume we have another scenario. One student attempts to put together a high-quality presentation for a classroom project using poster board and clipped pictures from old magazines. Another student in the same class downloads primary-source data from the Library of Congress, exchanges e-mail messages with a researcher at a distant university, and put together a multimedia presentation using his laptop computer. The former student is coming from a low-level income family whereas the later one comes from a high-level income family. Their community has a mixed level of income families and mixed ethnicities.

Looking at these situations, which have several real life elements, we can look for solutions and possibly the way for new sceneries. What kind of strategy should be followed to solve the problems for these cases? Can we solve the digital divide problem by just simply putting computers in every classroom in this particular case? To solve this particular problem in that district, every component of the school and community, such as

school administer, teachers, parents, and local, state, and federal officials, need to come together for a collaborative work. Therefore, I offer some strategies for practical purposes that every district, school, administer, teacher, student, or parent can apply when they come across such sceneries as above.

District administrators can lessen inequalities between schools in that district. They can survey schools within the district to determine differences in amount of equipment, type of equipment, and number and type of course offerings and whether these differences are substantial enough to constitute unequal access. Based on results of the survey, they can give their support to the district policy which outlines a minimum technology plan that offers all students the opportunity to become computer literate as defined by the district; be sure to require staff training and frequent assessment of the plan. They can develop a plan or set of strategies for assisting individual schools to meet the requirements of the district policy by getting state and federal support.

Schools can provide opportunities to increase access for those students whose families have limited economic means. To get parents involved in this program, schools can hold a lab night where students and parents work together at computers, if parents work in the day time. Schools also need to provide child care for those parents who have children during the lab nights. Some activities can be scheduled during the day for parents who are at home during the day, have other children at home during the evening, or have concerns about going out at night. If schools do not have enough equipment, they can apply for loaner equipment and loaner instructional software that can be borrowed for a specific amount of time; this could include computers, instructional videos, and hand-held calculators. Labs can be kept open before and after school, in the evenings, during

the summer (in conjunction with summer school) and schools can use volunteers to staff and supervise these additional hours. At the same time, schools can seek funds to serve groups with limited economic means, and they can work with the public library to make the equipment available to students during the summer.

School staff can increase access to educational technology of all students. First of all, to make all staff skilled computer users, computer classes can be offered. After that they can integrate computers at various skill levels. All staff should be advocators of equity and they ought to take notice and speak up when they see inequities of access or use. For example, they can survey the location of computers within their school and monitor who uses them; they can monitor whether all students have opportunities to go on "electronic" field trips or use networking to participate in collaborative projects. Based on the monitoring results, a plan can be developed to integrate diverse uses of computers and other educational technology across the curriculum such as *technology mini-grants*. With the help of that kind of grants, staff can help teachers to find ways to use technology in their classrooms. They can educate parents by developing classes to help them become computer literate while having parents and children work together on computer-based learning programs.

Teachers, in order to increase equity within their classroom, can study the usage gaps between male/female, white/minority, native English/limited English speaking non-disabled/disabled, higher achieving/lower achieving, and higher income/lower income groups. But first of all, they ought to become a comfortable and talented computer user. They can use peer tutoring in ways that encourage mentored student to learn computers and technology; as student gain skills, they can become peer tutors. They should require

all students to spend a minimum amount of time in the computer laboratory each week. For the unwilling students, teachers can invite speakers and role models to their class that represent a diversity of ethnic and cultural backgrounds, both sexes, all forms of abilities. A student computer committee can be created to help them with ideas for ensuring equitable use among all groups with using students' ideas. Pairing students with disabilities with non-disabled peers; or pairing males with females are some important instructional methods, but teachers should make sure of equal use for both pairs. They ought to avoid asking technical questions only of certain students and pay attention to use nonbiased language to reflect that technology is for everyone. Finally they can create a club for targeted students that taps an interest technology addresses; and explore how computers can accommodate the diverse learning styles of students.

The followings are some more suggestions that all districts, schools, administers, teachers, students or parents can apply at different levels. They can search for high tech business partners who often are interested in helping out local schools; the local chamber of commerce can help you contact organizations that are willing to provide schools with financial assistance or volunteer assistance for staff training, laboratory supervision, etc. They can write grants to receive public and private support while conduct special purpose fund-raising events. They can also find out what skills parents or guardians have that might be used in their programs when they seek hardware and software donations.
To sell, donate, or trade-in old equipment, some ways can be investigate like hold a garage sale Furthermore, new uses for older technology can be explored, for instance, older computers can become part of a writing lab.

At *international level*, four elements in the digital divide should be taken into account: *education, economy*, *governance* and *culture*. Of course, in the national level liberalization to reduce communication costs needs to be considered. This policy should be backed up with the creation of a universal service providing access to Internet. Moreover, the setting up and strengthening of independent national bodies shall prove its importance in consumer-friendly telecommunications market. On the other hand, the authorities should implement proactive policies with a view to increasing Internet use.

Formal education and life-long learning are at the core of this strategy. A country's capacity to take advantage of the knowledge economy depends on how quickly it can become a 'learning economy'. Learning means not only using new technologies to access global knowledge. So, in the context of "Bridging the Digital Divide" through education, the application of Information and Communications Technology (ICT) offers a tremendous potential such as:

- Increased access to underserved areas through distance learning,
- Improved quality of teaching and learning, through appropriate software aimed at providing information, tools and interactive learning, and using technology in constructivist ways to give students the looks to think critically and realize the power in developing their own media production,
- Strengthened education management systems, through connecting educational administrations and providing real time data/indicators and,
- Shared knowledge among policy makers and other stakeholders through well-organized knowledge management systems.

Also, some concrete actions such as promoting Internet use, investing in human resources and developing the Internet that is not too expensive, quicker and better protected must be taken into consideration as well. In public level; there must be taken some measures such as:

- Supplying Internet access points in every schools and libraries,
- Offering low-interest loans for public equipment in rural areas and poor urban districts,
- Taking steps to bring down equipment prices (lifting taxes, providing subsidies) and low interest loans for low-income families,
- Organizing free web training sessions for the disadvantaged,
- Offering free Internet addresses to all schoolchildren,
- Fostering competition in telecommunications to encourage low charges and
- To courage unmetered Internet access tariffs.
- ICT can help to bridge all the other divides, by helping to solve the basic problems of developing countries when it is fully integrated into government policies and the social and commercial life.
- Developed nations need to help close the gap by funding grassroots projects that use communication technologies to improve the standard of living, building of infrastructure, and establishing technology start-ups in developing nations (World Telecommunication Development Report, 2002).
- The governments of developing nations must play their role in formulating suitable strategies based on private sector participation, market liberalization and independent regulation (World Telecommunication Development Report, 2002).

Finally, I am going to suggest to all developed and developing countries, instead of allocating their budget to military they should use it for education. Then…it would give many opportunities to people who have-not…

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