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Reconceptualizing the Digital Divide

by Mark Warschauer

Abstract

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This paper examines the concept of a digital divide by introducing problematic examples of community technology projects and analyzing models of technology access. It argues that the concept provides a poor framework for either analysis or policy, and suggests an alternate concept of technology for social inclusion. It then draws on the historical analogy of literacy to further critique the notion of a divide and to examine the resources necessary to promote access and social inclusion.

Contents

As the Bush administration takes steps to dismantle the digital divide initiatives of the Clinton-Gore era, those who advocate technology access programs must consider their lines of defense and the rationale for their views. Is the "digital divide" a useful construct as originally conceived? Or should the notion be broadened or reconceptualized toward a different framework for analyzing technology access and social inclusion? I argue that a reconceptualization is in order. I begin the discussion with three vignettes, and then I turn to models of access for social inclusion, drawing on discussions of literacy.

A Slum "Hole in the Wall"

In 2000, the Government of New Delhi, in collaboration with an information technology corporation, established a project, known as the "Hole-in-the-Wall" experiment, to provide computer access to the city's street children [1]. An outdoor five-station computer kiosk was set up in one of the poorest slums of New Delhi. Though the computers themselves were inside a booth, the monitors protruded through holes in the walls, as did specially designed joysticks and buttons that substituted for the computer mouse. Keyboards were not provided. The

computers were connected to the Internet through dial-up access. A volunteer inside the booth helped keep the computers and Internet connections running.

No teachers or instructors were provided, in line with the concept called *minimally invasive education.* The idea was to allow the children unfettered 24-hour access, and to learn at their own pace and speed, rather than tie them to the directives of adult organizers or instructors.

According to reports, children who flocked to the site taught themselves basic computer operations. They worked out how to click and drag objects; select different menus; cut, copy, and paste; launch and use programs such as Microsoft Word and Paint; get on the Internet; and change the background "wallpaper". The program was hailed by researchers (e.g., Mitra, 1999) and government officials alike [2] as a ground-breaking project that offered a model for how to bring India's and the world's urban poor into the computer age.

However, visits to the computer kiosk indicated a somewhat different reality. The Internet access was of little use since it seldom functioned. No special educational programs had been made available, and no special content was provided in Hindi, the only language the children knew. Children did learn to manipulate the joystick and buttons, but almost all their time was spent drawing with paint programs or playing computer games.

There was no organized involvement of any community organizations in helping to run the kiosk, since such involvement was neither solicited nor welcomed [3]. And, indeed, the very architecture of the kiosk - based on a wall rather than a room - made supervision, instruction, and collaboration difficult.

Parents in the neighborhood had ambivalent feelings about the kiosk. Some saw it as a welcome initiative, but most expressed concern that the lack of organized instruction took away from its value. Some parents even complained that the kiosk was harmful to their children. As one parent stated, "My son used to be doing very well in school, he used to concentrate on his homework, but now he spends all his free time playing computer games at the kiosk and his schoolwork is suffering." In short, parents and the community came to realize that "minimally invasive education" was, in practice, minimally effective education.

An Information Age Town

In 1997, Ireland's national telecommunications company held a national competition to select and fund an "Information Age Town" [4]. A rationale of the effort was to help overcome the gap between Ireland's emerging status as a multinational business center of information and communication technology (ICT) *production* and the rather limited *use* of ICT among Ireland's own people and indigenous small businesses.

Towns of 5,000 people and more across Ireland were invited to compete by submitting proposals detailing their vision of what an Information Age Town should be and how they could become one. The winning town was to receive 15 million Irish pounds (at that time roughly $22 million U.S. dollars) to implement its vision.

The sponsor of the competition, Telecom Eirann (later renamed Eircom), was getting ready to be privatized. The company naturally had an interest in selecting the boldest, most ambitious proposal so as to showcase the winning town as an innovative example of what advanced telecommunications could accomplish for the country under the company's leadership. Four towns were chosen as finalists, and then Ennis, a small, remote town of 15,000 people in Western Ireland, was selected among them as the winner. The prize money that Ennis received represented over $1,200 U.S. dollars per resident, a huge sum for a struggling Irish town.

At the heart of Ennis's winning proposal was a plan to give an Internet-ready personal computer to every family in the town. Other initiatives included an ISDN line to every business, a Web site for every business that wanted one, smart card readers for every business (for a cashless society), and smart cards for every family. Ennis was strongly encouraged by Telecom Ireland to implement these plans as quickly as possible.

Meanwhile, the three runners up - the towns of Castlebar, Kilkenny, and Kilarney - each received consolation

prizes of 1 million Irish pounds (about $1.5 million U.S. dollars). These towns were given us much time as they needed to make use of the money.

How did the project turn out? A visit to Ennis three years later by a university researcher indicated that the town had little to show for its money. Advanced technology had been thrust into people's hands with little preparation. Training programs had been run, but they were not sufficiently accompanied by awareness programs as to why people should use the new technology in the first place. And in some instances, well-functioning social systems were disrupted in order to make way for the showcase technology.

For example, as is the case in the rest of Ireland, the unemployed of Ennis had been reporting to the social welfare office three times a week to sign in and receive payments. Following their visits, the people usually stayed around the office to chat with other unemployed workers. The sign-in system thus facilitated an important social function to overcome the isolation of the unemployed.

As part of the "Information Age Town" plan, though, the unemployed received computers and Internet connections at home. They were instructed to sign in and receive electronic payments via the Internet rather than come to the office to sign in. But many of the unemployed couldn't figure out how to operate the equipment, and most others saw no reason to do so when it deprived them of an important opportunity for socializing. A good number of those computers were reportedly sold on the black market, and the unemployed simply returned of their own accord to coming to the social welfare office to sign in.

Meanwhile, what happened in the other three towns? With far fewer resources, they were forced to carefully plan how to make use of their funds, rather than splurging for massive amounts of equipment. Community groups, small businesses, and labor unions were involved in the planning process. Much greater effort and money were spent on developing awareness, planning and implementing effective training, and setting up processes for sustainable change, rather than merely on purchase of equipment. The towns built on already existing networks among workers, educators, and businesspeople to support grassroots uses of technology for social and economic development.

Information about social services and job opportunities was put online. Small businesses and craft workers learned how to pool their resources to promote their products through e-commerce. Technology coordinators were appointed at schools and worked with other teachers to develop plans for better integration of ICT in classrooms. In the end, according to a researcher from University College Dublin [5], the three runners-up‹which each received only 1/15 of the money that Ennis received - actually had more to show for their efforts to promote social inclusion through technology than did the winner.

A Model Computer Lab

An international donor project funded by the United States Agency for International Development (USAID) decided to donate a computer laboratory to the college of education at a major Egyptian university [6]. The purpose of the donation was to establish a model teacher-training program in computer-assisted learning in one of the departments of the college. State-of-the-art equipment was selected, including more than 40 Pentium III computers, an expensive video projection system, several printers and scanners, and tens of thousands of U.S. dollars worth of educational software. This was to be a model project that both the U.S. and Egyptian governments would view with pride. To guarantee that the project would be sustainable, the Egyptian university would be required to manage all the ongoing expenses and operations, including paying for Internet access, maintaining the local area network (LAN), and operating the computer laboratory.

Under a paid contract from USAID, a committee from the college of education within the Egyptian university put together a detailed proposal on how the laboratory would be used, run, and maintained. Based on this proposal, USAID purchased all the hardware and software. However, well before the equipment was installed, it became clear that the college would have difficulty absorbing such a huge and expensive donation. Other departments within the college - which, together, had access to only a handful of computers - became envious that a single

department would have such modern and expensive equipment, and they attempted to block the university's support for the lab. The college and university could not easily justify spending the money to house and maintain such an expensive laboratory for a single program when other programs were poorly funded. No money was available to hire an outside LAN manager or provide Internet access at the level agreed upon in the proposal. Faculty relations problems also arose, as a key department chair resented the involvement and initiative of less-senior faculty members who were taking computer training and working together to plan new curricula. Due to all these difficulties, the expensive state-of-the-art computers sat in boxes in a locked room for more than a year before they were even installed, thus losing about one-third of their economic value.

Rethinking the Digital Divide

Each of the programs described in the preceding vignettes was motivated by a sincere attempt to improve people's lives through ICT. But each program ran into unexpected difficulties that hindered the results. Of course any ICT project is complicated, and none can be expected to run smoothly. But the problems with these projects were neither isolated, nor random. Rather, these same types of problems occur again and again in technology projects around the world, which too often focus on providing hardware and software and pay insufficient attention to the human and social systems that must also change for technology to make a difference. As seen in these three vignettes, meaningful access to ICT encompasses far more than merely providing computers and Internet connections. Rather, access to ICT is embedded in a complex array of factors encompassing physical, digital, human, and social resources and relationships. Content and language, literacy and education, and community and institutional structures must all be taken into account if meaningful access to new technologies is to be provided.

Some would try, as I myself have in the past, to stretch the notion of a digital divide to encompass this broad array of factors and resources. In this sense, a digital divide is marked not only by physical access to computers and connectivity, but also by access to the additional resources that allow people to use technology well. However, the original sense of the digital divide term - which attached overriding importance to the physical availability of computers and connectivity, rather than to issues of content, language, education, literacy, or community and social resources - is difficult to overcome in people's minds.

A second problem with the digital divide concept is its implication of a bipolar societal split. As Cisler (2000) argues, there is not a binary division between information "haves and "have-nots", but rather a gradation based on different degrees of access to information technology. Compare, for example, a professor at UCLA with a high-speed connection in her office, a student in Seoul who occasionally uses a cyber-cafè, and a rural activist in Indonesia who has no computer or phone line but whose colleagues in her women's group download and print out information for her. This example illustrates just three degrees of possible access a person can have to online material.

The notion of a binary divide between the haves and the have-nots is thus inaccurate and can even be patronizing as it fails to value the social resources that diverse groups bring to the table. For example, in the United States, African-Americans are often portrayed as being on the wrong end of a digital divide (e.g., Walton, 1999), when in fact Internet access among Blacks and other minorities varies tremendously by income group - with divisions between Blacks and Whites decreasing as income increases (National Telecommunications and Information Administration, 2000). Some argue that the stereotype of disconnected minority groups could even serve to further social stratification, by discouraging employers or content providers from reaching out to those groups. As Henry Jenkins, director of comparative media studies at the Massachusetts Institute of Technology, argues, "The rhetoric of the digital divide holds open this division between civilized tool-users and uncivilized nonusers. As well meaning as it is as a policy initiative, it can be marginalizing and patronizing in its own terms" [7].

In addition, the notion of a digital divide - even in its broadest sense - implies a chain of causality, i.e., that lack of access (however defined) to computers and the Internet harms life chances. While this point is undoubtedly true, the reverse is equally true; those who are already marginalized will have fewer opportunities to access and use computers and the Internet. In fact, technology and society are intertwined and co-constitutive, and this complex interrelationship makes any assumption of causality problematic.

Finally, the digital divide framework provides a poor roadmap for using technology to promote social development since it overemphasizes the importance of the physical presence of computers and connectivity to the exclusion of other factors that allow people to use ICT for meaningful ends. Rob Kling, director of the Center for Social Informatics at Indiana University, explains well this shortcoming [8]:

> "[The] big problem with "the digital divide " framing is that it tends to connote "digital solutions, " i.e., computers and telecommunications, without engaging the important set of complementary resources and complex interventions to support social inclusion, of which informational technology applications may be enabling elements, but are certainly insufficient when simply added to the status quo mix of resources and relationships."

The bottom line is that there is no binary divide, and no single overriding factor for determining such a divide. ICT does not exist as an external variable to be injected from the outside to bring about certain results. Rather, it is woven in a complex manner in social systems and processes. And, from a policy standpoint, the goal of using ICT with marginalized groups is not to overcome a digital divide, but rather to further a process of social inclusion. To accomplish this, it is necessary to "focus on the transformation, not the technology" [9]. For all these reasons, I join with others (e.g., DiMaggio and Hargittai, 2001; Jarboe, 2001) in recognizing the historical value of the digital divide concept (i.e., that it helped focus attention on an important social issue) while preferring to embrace alternate concepts and terminology that more accurately portray the issues at stake and the social challenges ahead.

Technology for Social Inclusion

The alternate framework I suggest is that of *technology for social inclusion.* Social inclusion and exclusion are prominent concepts in European discourse [10]. They refer to the extent that individuals, families, and communities are able to fully participate in society and control their own destinies, taking into account a variety of factors related to economic resources, employment, health, education, housing, recreation, culture, and civic engagement.

Social inclusion is a matter not only of an adequate share of resources, but also of "participation in the determination of both individual and collective life chances" (Stewart, 2000). It overlaps with the concept of socioeconomic equality, but is not equivalent to it. There are many ways that the poor can have fuller participation and inclusion, even if they lack an equal share of resources. At the same time, even the well-to-do may face problems of social exclusion, due to reasons of political persecution or discrimination based on age, gender, sexual preference, or disability. The concept of social inclusion does not ignore the role of class, but recognizes that a broad array of other variables help shape how class forces interact. Though an historical treatment of the term is beyond the scope of this article, one could argue that the concept of social inclusion reflects particularly well the imperatives of the current information era, in which issues of identity, language, social participation, community, and civil society have taken central stage (Castells, 1997).

Models of Access

What role, then, can access to technology play in promoting social inclusion? That depends in large measure on how we define "access." The most common model for thinking about access to technology is that based on ownership of, or availability of, a device, in this case a computer. Physical devices can diffuse relatively quickly, and, in some cases, equally; note for example the almost universal degree of television ownership in the U.S. among both rich and poor. However, the device model has several flaws, starting with the fact that the actual purchase price of a computer is only the small part of what can be considered the *total cost of ownership,* which includes the price of software, maintenance, peripherals, and, in institutional settings, training, planning, and administration (see comments by Kling in Patterson and Wilson, 2000) - not to mention the price of replacement hardware and software due to corporate-planned product obsolescence. More importantly, other barriers beyond affordability of computers (or of the broader computing package) will continue to play a major role in fostering

digital inequality. These barriers include differential access to broadband telecommunications; differences in knowledge and skills in using computers, or in attitudes toward using them; inadequate online content available for the needs of low-income citizens, especially in diverse languages; and governmental controls or limitations on unrestricted use of the Internet in many parts of the world (see discussion in DiMaggio and Hargittai, 2001).

The device model is improved somewhat by a *conduit* model [11]. While a device can be acquired through a one-time purchase, access to a conduit necessitates connection to a supply line that provides something on a regular basis, such as electricity, telephone service, or cable television. Diffusion of conduits is slower than that of devices, either because a delivery infrastructure must be established first (such as the installation of telephone lines or fiber optic cables) or because the cost of a regular monthly fee is a disincentive to access. For example, conduits such as electricity, telephone service, and cable television service have diffused more slowly than devices such as television sets, radios, and videocassette recorders.

The diffusion of conduits often involves a high degree of social mobilization and struggle to insure equal access. This occurred most notably in regard to electricity, where different countries chose different paths to mass (or selective) electrification due in large part to the balance of social and class forces in the country [12]. Similarly, in many countries, lengthy social struggles have been carried out on behalf of universal telephone access.

Though conduits provide a better comparative model for ICT than do devices, neither category captures the essence of meaningful access to information and communication technologies. What is most important about ICTs is not so much the availability of the computing device or the Internet line, but rather people's ability to make use of that device and line to engage in *meaningful social practices.* Those people who cannot read, who have never learned to use a computer, and who do not know any of the major languages that dominate available software and Internet content will have difficulty even getting online much less using the Internet productively.

Literacy

A better model of access is provided by the concept of literacy. While the common sense definition of literacy is the individual skill of being able to read and write, many theorists prefer a broader definition that takes into account the social contexts of literacy practice. They point out that what is considered skillful reading or writing varies widely across historical, political, and sociocultural contexts (Gee, 1996). Witness, for example, the well-known example of changing literacy practices before and after the diffusion of the printing press (see discussion in McLuhan, 1962; Eisenstein, 1979), or the differences between the types of literacy valued in a Pakistani *madrassa* (religious school) as compared to a U.S. university. In this broader sense, then, literacy involves "having mastery over the processes by means of which culturally significant information is coded" [13].

There are many similarities between literacy and ICT access (see Table 1). First, both literacy and ICT access are closely connected to advances in human communication and the means of knowledge production. Second, just as ICT access is a prerequisite for full participation in the informational stage of capitalism, literacy was (and remains) a prerequisite for full participation in the earlier industrial stages of capitalism. Third, both literacy and ICT access necessitate a connection to a physical artifact (i.e., a book or a computer), to sources of information that get expressed as content within or via that physical artifact, and to a skill level sufficient to process and make use of that information. Fourth, both involve not only receiving information but also producing it. Finally, they are both tied to somewhat controversial notions of societal divides: the *great literacy divide* and the *digital divide.*

Table 1: Comparing Literacy and ICT Access

	Literacy	ICT Access

Communication Stage	Writing, print	Computer-mediated communication
Economic Era	Industrial capitalism	Informational capitalism
Physical Artifact	Books, magazines, newspapers, journals	Computer
Organization of Content	Novels, short stories, essays, articles, reports, poems, forms	Web sites, e-mail, instant messages
Receptive skills	Reading	Reading + multimedia interpretation, searching, navigating
Productive skills	Writing	Writing + multimedia authoring and publishing
Divides	A great literacy divide?	A digital divide?

The Literacy Divide

One of the most important theoretical questions related to the social practice of literacy, and one that corresponds to current debates over a digital divide, is whether there exists a *great literacy divide.* Literacy is distributed and practiced on a highly unequal basis, and is highly correlated with income and wealth at both an individual and a societal level. So the importance of literacy in social and individual development is broadly recognized.

What is disputed, though, is the issue of causality, that is, whether literacy enables development, or whether unequal development (and corresponding unequal distribution of political, economic and social power) restricts people's access to literacy. Some advocates of the former notion posit the existence of a literacy divide. From this perspective, there are fundamental cognitive differences in individuals who are literate and who are not, resulting in a great literacy divide at both the individual and societal levels. Literacy has been said to separate prehistory from history (Goody and Watt, 1963), primitive societies from civilized societies (Levi Strauss, in Charbonnier, 1973), and modern societies from traditional societies (Lerner, 1958; see discussion in Scribner and Cole, 1981). At the individual level, literacy has been said to allow people to master the logical functions of language (Goody, 1968; Olson, 1977) and to think abstractly (Greenfield, 1972; Luria, 1976).

The imputed cognitive benefits of literacy have proven difficult for researchers to investigate. The problem is that literacy is almost always confounded with other variables, particularly with schooling. For the most part, those who are completely illiterate tend to have had little or no schooling, whereas those with high levels of literacy tend to have had a good deal of schooling. And amount of schooling usually correlates directly with income levels of a child's family, or the work engaged in by the child's family.

Two educational psychologists, Sylvia Scribner and Michael Cole, developed a creative solution to the research problem of determining the particular cognitive benefits of literacy in isolation from its covariants. They identified a tribe in Liberia, the Vai, that had developed its own written script in the tribe's own local language. Literacy in the Vai script was passed on through informal tutoring, not through formal schooling. Vai writing was used in very limited ways, mostly for personal correspondence and business records. By carrying out a three-way study that compared illiterate tribal members, those literate only in the Vai language (through personal tutoring), and those with broader English or Arabic literacy skills gained through schooling, Scribner and Cole (1981) were able to separate which cognitive benefits could be most likely attributed to literacy and which others were most likely due to the broader environment of formal education.

Interestingly, Scribner and Cole found virtually no generalizable cognitive benefits from Vai literacy. Individual differences on a range of cognitive tasks, in areas such as abstraction, classification, memory, and logic, were instead due to other factors, such as schooling, or, in some cases, living in an urban (as opposed to rural) area. Scribner and Cole's study helped settle the question whether or not there is a great literacy divide, at least at the individual level. Their work showed that there is no single construct of literacy that divides people into two cognitive camps. Rather there are gradations and types of literacies, with a range of benefits closely related to the specific functions of literacy practices. Literacy, in a general sense, cannot be said to cause cognitive or social development; rather literacy and social development are intertwined and co-constituted, as are technologies and society in general.

Acquisition of Literacy

If literacy is understood as a set of social practices rather than a narrow cognitive skill, this has several important consequences for thinking about the acquisition of literacy, and important parallels with the acquisition of access to ICT. Literacy acquisition, like access to ICT, requires a variety of resources. These include physical artifacts (books, magazines, newspapers, journals, computers, etc.); relevant content transmitted via those artifacts; appropriate user skills, knowledge, and attitude; and the right kinds of community and social support.

The physical availability of books or other reading material is of course essential for the acquisition of literacy, but the other resources are equally important. As for relevant and accessible content, one of the major obstacles toward literacy acquisition is the dearth of published material in many if not most of the 7,000 languages that are spoken around the world. In addition, Paolo Freire (1994) and others have shown that literacy instruction is most effective when it involves content that speaks to the needs and social conditions of the learners. And, as with ICT-related material, this content is often best developed by the learners themselves.

Literacy acquisition obviously requires the development of a variety of skills, knowledge, and attitude, including cognitive processing skills; background knowledge about the world; and the motivation, desire, and confidence to read - and this has important parallels to the kinds of skills, knowledge, and attitudes necessary to make meaningful use of ICT.

Finally, learning to read is a social act that intersects in a myriad a way with social structure, social organization, and social practices. People learn to read (and to read in certain ways) when they are surrounded by people who support them in the process, ranging from parents that read to them, to schoolmates that discuss comic books together, to village elders that value children's education.

The multifaceted nature of literacy, the range of resources it requires, and the social nature of its practice and mastery all point to conclusion that the acquisition of literacy is a matter not only of cognition, or even of culture, but also of power and politics (Freire, 1970; 1994; Freire and Macedo, 1987; Gee, 1996; 1984; Street, 1995). From South Africa to Brazil to the impoverished ghettos of the United States, access to literacy intersects with unequal opportunities to attend school, inequitable distribution of resources within the educational system, and curricula and pedagogy that meet the needs of certain social groups more than others. Perhaps the most obvious evidence of this phenomenon is the appallingly low rate of women's literacy in many countries in the world today. Because of the politicized nature of literacy, campaigns that focus exclusively on individual skill while ignoring broader social systems that support or restrict extended literacy are not always the most effective. In many cases literacy is not so much granted from above, as seized from below through the social mobilization and collective action of the poor and dispossessed.

Literacy and ICT Access

A synthesis of the above discussion yields six principal conclusions about literacy:

1. There is not just one, but many types of literacy;
2. The meaning and value of literacy varies in particular social contexts;
3. Literacy capabilities exists in gradations, rather than in a bipolar opposition of literate versus illiterate;
4. Literacy alone brings no automatic benefit outside of its particular functions;

5. Literacy is a social practice, involving access to physical artifacts, content, skills, and social support; and,
6. Acquisition of literacy is a matter not only of education, but also of power.

These points serve well as the basis of a model of ICT access: There is not one type of ICT access, but many; the meaning and value of access varies in particular social context; access exists in gradations, rather than in a bipolar opposition; computer and Internet use bring no automatic benefit outside of particular functions; ICT use is a social practice involving access to physical artifacts, content, skills, and social support; and, acquisition of ICT access is a matter not only of education, but also of power.

Access to ICT for the promotion of social inclusion cannot rest on the provision of devices or conduits alone. Rather, it must entail the engagement of a range of resources, all developed and promoted with an eye toward enhancing the social, economic, and political power of the targeted clients and communities. Any attempt to categorize these resources is by nature arbitrary, but an analysis based on four general categories serves the purposes of both analysis and policy-making. These categories have emerged from my ethnographic research in Hawai'i (e.g., Warschauer, 1999) and Egypt (Warschauer, in press) as well in my case study research in California, Brazil, and India, and have been pointed to in similar terms by other researchers and theorists who have examined issues of technology and social inclusion in various contexts (see, for example, Aichholzer and Schmutzer, 2001; Carvin, 2000; Wilson, 2000). They can be labeled (1) Physical Resources, (2) Digital Resources, (3) Human Resources, and (4) Social Resources (see Figure 1). Physical resources encompass access to computers and telecommunication connections. Digital resources refer to digital material that is made available online. Human resources revolve around issues such as literacy and education (including the particular types of literacy practices that are required for computer use and online communication). Social resources refer to the community, institutional, and societal structures that support access to ICT.

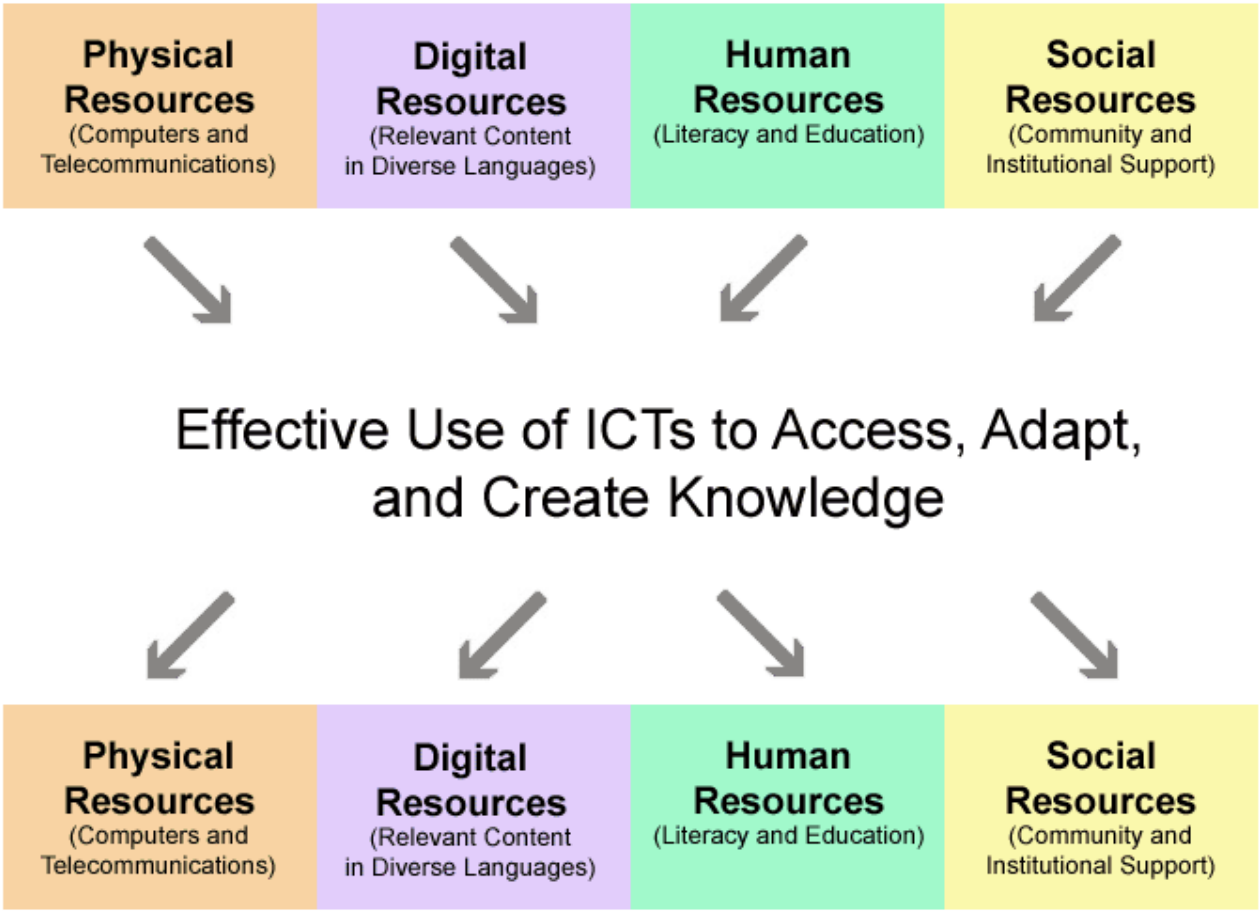

Figure 1: Effective Use of ICTs

In considering these four sets of resources, it is important to realize their iterative relation with ICT use. On the one hand, each of the resources is a *contributor* to effective use of ICTs. In other words, the presence of these resources helps ensure that ICT can be well used and exploited. On the other hand, access to each of these resources is a *result* of effective use of ICTs. In other words, by using ICTs well, we can help extend and promote access to these resources. If handled well, these resources can thus serve as a virtual circle that promotes social development and inclusion. If handled poorly, these elements can serve as a vicious cycle of underdevelopment and exclusion.

Conclusion

Given the Bush administration's cutbacks of technology access programs, there are those who might say that now is not the time to question the idea of a digital divide. Here again, though, the analogy of literacy serves a lesson. Challenging the notion of a great literacy divide, and developing a more sophisticated understanding of literacy, did not lead to a downplaying of literacy's importance. Rather, by better understanding literacy, educators and policy-makers could better promote it. Those who have critiqued simplistic asocial frameworks of literacy have been at the forefront of efforts to extend literacy, starting with the Paolo Freire, who both put forward a socially-rooted critical concept of literacy and also helped devise mass literacy campaigns in several countries around the world.

Similarly, a critique of the notion of a digital divide is necessary to fully inform and unleash efforts to use technology to promote social inclusion. Overly simplistic notions of a digital divide lead to the kinds of problematic outcomes discussed in the above vignettes, which in turn provide grist for the mill of those who would like to end all community technology funding.

A framework of technology for social inclusion allows us to re-orient the focus from that of gaps to be overcome by provision of equipment to that of social development to be enhanced through the effective integration of ICT into communities and institutions. This kind of integration can only be achieved by attention to the wide range of physical, digital, human, and social resources that meaningful access to ICT entails.

Those who popularized the term "digital divide" have helped focus public attention on the important social issue of technology and inequality. It is now time to deepen public understanding of this issue through a more thorough appraisal of what access to ICT entails and of the ends that such access serves.

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This article draws on the author's broader discussion of these issues in the forthcoming book, *Technology and Social Inclusion: Rethinking the Digital Divide*, to be published by MIT Press in fall 2002.

Notes

1. Information on this project comes from a paper by Sugata Mitra (1999), personal communication with Chetan Sharma (July 2001), and my own visit to the site and interviews with users and community residents in July 2001.

2. Personal communication, S. Regunathan, Principal Secretary for Information Technology, Government of New Delhi, July 2001.

3. The director of the project told me that he intentionally eschewed the involvement in the kiosks of neighborhood organizations, since he preferred working "directly with the people." Based on an interview with S. Regunathan, Principal Secretary for Information Technology, Government of New Delhi, July 2001.

4. Information on this competition and its results comes from the Web site of Eircom (http://www.eircom.ie); the Web sites of the four winning towns (http://www.ennis.ie, http://www.castlebar.ie, http://www.kilkenny.ie, and http://kerry.local.ie/killarney) and personal communication from John Mooney, University College Dublin, May 2001.

5. Personal communication, John Mooney, May 2001.

6. Information on this project comes from my personal involvement as a staff member on a USAID-funded program in Egypt.

7. Quoted in Young, 2001, p. A51.

8. Personal communication, January 2002.

9. Jarboe, 2001, p. 31.

10. For general overviews, see Askonas and Stewart (2000), Byrne (1999), and Littlewood , Glorieux, Herkommer, and Jonsson (1999). For particular discussion of relationship to technology, see Commission of the European Communities (2001).

11. For a discussion of the conduit model and its limitations, see Lievrouw (2000).

12. See, for examples, discussion of electrification in South Africa, by Renfrew (1984); in the Soviet Union, by Abamedia (1999), and Nye (1990); in Western Europe, by Nye, (1990); and in the U.S., by Brown (1980).

13. de Castell and Luke, 1986, p. 374.

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