

Beyond Technology
\$100 Laptops, Effective Use and the Digital Divide

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Introduction

November 17, 2005 was a good day for Nicholas Negroponte.

The MIT professor and Chairman of One Laptop Per Child, Ltd. had just watched UN Secretary General Kofi Annan unveil the prototype his brainchild, the \$100 laptop. Now, the media gathered at the World Summit on the Information Society (WSIS) were trumpeting his invention as the solution to the digital divide, a kind of technological silver bullet that would guarantee Internet access for individuals all over the world.

But amidst the foreign dignitaries and flashbulbs, one very important question was not being asked: can the digital divide be overcome by purely technological solutions? This paper will argue that the exclusive focus on technology is rooted in a narrow conception of the digital divide phenomenon, and relies on an implicit technological determinism to craft its solutions. Such an approach cannot overcome the economic, social and cultural dimensions of global information inequality.

Instead, a more nuanced understanding of the digital divide is required, accounting for the culturally and socially specific challenges to meaningful Information Communication Technology (ICT) use faced by individuals around the world. Armed with a more sophisticated definition of the digital divide, it will be possible to design solutions that promote what Michael Gurstein calls “effective use” of ICTs (2001: 9). Crucially, such solutions must fuse access to technology with training, contextualized strategies for facilitating use, and the production of culturally relevant content.

The limitations of technological solutions and the dimensions of effective use will be discussed in turn. However, it is first necessary to examine the concept of the digital divide in greater detail.

What is the Digital Divide?

On the surface, the digital divide phenomenon appears straightforward: it is the gap between those who have access to Information Communication Technologies (ICTs), and those who do not. This definition continues to inform much of the journalism, public policy and scholarship (e.g. Compaine, 2001: *xi*) concerning the

digital divide. However, a growing number of theorists are challenging this view, arguing that the overly simplistic nature of this definition obscures the true nature of the digital divide. Moreover, the definition leads to the wrong kinds of solutions. A broader conception of the digital divide is needed before the problem can be properly addressed.

Broadening the definition of the digital divide first requires recognition of its inherent complexity. As Mark Warschauer notes, “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” (2002: 5). ICT use is thus more properly viewed as a continuum, with substantial variations based on the social and cultural resources of different individuals, groups and communities (Gunkel, 2003: 507). As such, the 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” (Warschauer, 2002: 5). By challenging binary, zero/sum conceptions of the digital divide, Warschauer reveals that ICT disparities are about much more than access to technology.

Lisa Servon furthers this view, arguing that access to computers and the Internet is only one aspect of the digital divide. A complete definition of the problem must also incorporate conceptions of *training* and *content* (2002: 7). For Servon, training involves engendering “the ability to use IT for a range of purposes, and the knowledge of how and why IT can be used as a key resource,” while content refers to the availability of material that “meets the needs and demands of disenfranchised groups” and “is created by these groups” (2002: 7). Thus, Servon pushes the digital divide beyond technological access, reformulating the problem as an inability to both meaningfully use ICTs and access relevant content.

Another persistent problem in digital divide discourse is the question of scale. When Compaine argues that “perhaps it is fair to argue that the digital divide is disappearing on its own” (Compaine, 2001: 334), he is referring to data assessing the distribution of ICT use *within* the United States. There is some evidence to support this claim, although his analysis remains rooted in a techno-centric conception of the digital divide. However, no such evidence can be found on an international scale. The global digital divide—that is, the disparity of access to ICT *between* nations—remains a huge problem. As Norris observes, “the global divide in access to digital technologies is substantial, and has been growing during the first decade of the

information age” (2001: 233). Not only is the global digital divide a serious predicament, it is also getting worse. Even a cursory analysis of the relevant statistics is alarming. In the United States, approximately 26 per cent of the population is online, while in South Asia, less than 0.1 per cent of the population has access to the Internet (Servon, 2002: 42). The United States accounts for less than five per cent of the world’s population, yet accounts for nearly one quarter of the world’s Internet users (Servon, 2002: 42). Clearly, the global digital divide is a very real and urgent challenge for the international community.

Finally, a definition of the digital divide must carry an understanding of why the gap in ICT access must be closed. Traditional definitions correctly identify participation in the global economy as a central benefit of access to information technology. However, the social and political aspects of ICT use are equally important. Specifically, ICTs are instrumental in overcoming poverty. According to Don Slater and Jo Tacchi, poor individuals and communities in the developing world possess “an almost universal belief that ICTs and ICT skills are increasingly central to surviving or thriving in the modern world and that these technologies increasingly define their children’s future—globally, regionally, nationally and locally” (2004: 85). In this sense, lack of access to information technology creates a *de facto* form of social exclusion. As Norris notes, “one of the greatest hardships endured by the poor, and by many others who live in the poorest countries is their sense of isolation” (Norris, 2001: 66). Closing the digital divide is thus an integral component of ending global poverty, and providing the means for individuals to “fully participate in society and control their own destinies” (Warschauer, 2002: 6). Perhaps Ethiopian president Meles Zenawi puts it best: “ICT is the fastest way to end our isolation” (quoted on Ft.com, 03/28/2006).

Based on these critical interventions, it is now possible to formulate a working definition of the digital divide: it is a continuum of ICT use, not a binary distinction between those who have access to ICTs and those who do not; the problem includes disparities in training and relevant content in addition to technological access; it is a global phenomenon; and it is a barrier to the elimination of poverty. To be considered successful, any potential solution to the digital divide must address all of these elements.

\$100 Laptops and the Limits of Technological Determinism

Negroponte's One Laptop Per Child (OLPC) project is remarkable for its technological innovation, global scope and initial successes. The OLPC laptop is a marvel unto itself—durable, simple to use and so energy efficient simple hand-cranking provides enough power for operation (OLPC, 2005). The machine also makes use of wireless 'mesh' networking, allowing many different computers to use one Internet connection (OLPC, 2005). In one inexpensive, lime-green package, the \$100 Laptop simultaneously overcomes several physical barriers to ICT use. It is suitable for rugged use in remote areas, it does not require an electrical outlet and the laptop has no need for extensive network infrastructure to access the Internet. In other words, it is perfect for use in developing nations.

The size of the project is also impressive. With up to 10 million \$100 laptops being produced for pilot projects in China, India, Brazil, Argentina, Egypt, Nigeria and Thailand, the OLPC project is attempting to tackle the digital divide on a truly global scale. The project has also been remarkably successful in attracting positive media attention. Press enthusiasm for the project is evident from the headlines alone: "\$100 Laptop Bridges Digital Divide" (Reuters, 17/11/2005); "Waking Up To a Laptop Revolution" (FT.com, 28/03/2006); and, most messianic of all, "The Laptop That Will Save The World" (New York Times Magazine, 11/12/2005).

But does the OLPC laptop warrant this kind of effusive support? Unfortunately, the project is severely limited by its exclusively technological approach to the digital divide. Implicit in the \$100 laptop program is a strong current of *technological determinism*. This perspective tends to assume that technology "is the *sufficient* or *necessary* condition for social change," or at least "a key factor that *may facilitate* change" (Gunkel, 2003: 510). The technologically deterministic approach to the digital divide holds that once the tools are put in people's hands, the disparities in ICT access will disappear. However, this perspective fails to recognize the other dimensions of the digital divide, namely the lack of skills for meaningful ICT use and the absence of relevant online content. In the OLPC project, the exclusion of skills and training is not an oversight. It is a central component of the program's philosophy. According to Negroponte:

*OLPC is not about learning something. It is about learning **learning**. Children make things with their laptops, they explore and communicate. When a child, even in the most remote and poorest part of a developing country, is given an electronic game, the first thing he or she will do is discard the manual. The second is use the machine. The speed with which this child will acquire the knowledge to use the device is so astonishing, you risk thinking it is genetic* (quoted on FT.com, 28/03/2006).

Mark Warschauer gives ample evidence to doubt this optimistic view. In 2000, the government of New Delhi created the ‘Hole-in-the-wall’ computer kiosk program to provide ICT access to the city’s poorest children (2002: 2). The project was predicated on an idea of ‘minimally invasive education’, where children learned to use the computers with little supervision. The results were predictable. In the absence of formal guidance or facilitation, the children spent the majority of their time playing games or drawing with the paint program. Some parents even complained that the kiosks were interfering with their child’s schooling. As Warschauer notes, “the community came to realize that ‘minimally-invasive education’ was, in practice, minimally-effective education” (2002: 2). By subscribing to this philosophy, the OLPC laptop mat suffer the same fate as the New Delhi computer kiosks.

The OLPC project also makes no provision for access to relevant content. The information sought by citizens of developing nations—“information that is directly related to their lives and their communities” (Servon, 2002: 7)—does not exist online. Moreover, if relevant material does make it onto the Internet, disadvantaged individuals lack the skills to find it (Servon, 2002: 7). Language also represents a huge barrier for access to content, as the vast majority of webpages—84 per cent—are in English (Norris, 2001: 60). While the \$100 laptop may provide physical access to the Internet, it does not ensure the presence of meaningful information or develop an individual’s capacity to create relevant content.

Taken together, the absence of training or content provision within the OLPC project severely undermines its ability to close the digital divide. As Warschauer notes, “these same types of problem 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” (2002: 4). Clearly, a more holistic strategy for addressing the digital divide is urgently needed.

Closing the Digital Divide Through Effective Use

Gurstein defines effective use as “the capacity and opportunity to successfully integrate ICTs into the accomplishment of self or collaboratively defined goals” (2003: 9). In other words, projects that incorporate this concept attempt to overcome the digital divide by teaching individuals how to use ICT to better their lives and the lives of their communities, rather than simply providing them with technological tools. In addition to physical resources like computers and Internet connections, effective use approaches emphasize developing an individual or community’s digital resources, or access to relevant online material; human resources, such as literacy and education; and social resources, including the community, institutional and societal structures that support ICT access (Warschauer, 2002: 11). Effective use also stresses contextuality. That is, “what is effective in one context will not necessarily be so in another context” (Gurstein, 2003: 13). Solutions must therefore be designed with a community or nation’s particular political, economic, social and cultural circumstances in mind.

Thus, effective use strategies effectively address all aspects of the digital divide highlighted by this paper. Its emphasis on contextuality is more appropriate for addressing a continuum of ICT use, and creates flexible solutions for the specific social and cultural circumstances found in developing nations. Non-technological barriers such as language and education are acknowledged within this strategy, and solutions are crafted accordingly. By focusing on digital, human and social resources in addition to questions of technological access, effective use addresses the need for training, skills and access to relevant content in creating meaningful access to ICTs. Finally, by focusing on people rather than machines, effective use fits within a broader development context. It thus emerges as a particularly useful perspective for integrating ICT use with the eradication of poverty. As a concept, effective use creates strategies “which will be of more direct benefit to end users in developing countries” (Gurstein, 2003: 17).

Case Study: Kothmale Community Radio and Internet Project

While ‘effective use’ is a superior paradigm for addressing the digital divide, the question remains: what would a project that encourages effective use look like? For Gurstein, effective use is built by developing *community informatics*, or situating “the design and implementation of ICT systems in their community and social context” (2003: 15). A compelling example of community informatics at work is Sri Lanka’s Kothmale Community Radio and Internet Project (KCRIP). Founded as a community radio station in 1989 with support from the Sri Lankan Broadcasting Corporation (SLBC), UNESCO support allowed KCRIP to expand into an Internet service provider in 1998. The station facilitates access to ICT in several ways. It provides direct Internet access through several computers housed at KCRIP’s main broadcasting facility and two remote locations. It also maintains a database of relevant content, allowing residents to quickly access popular and useful information.

However, the most innovative aspect of KCRIP is its pioneering use of ‘radio-browsing’ to facilitate Internet access (Gumucio Dagon, 2001: 129). If a listener requires a specific piece of online information, they are able to phone or write-in their question to the station. Trained volunteers then use the Internet to find the appropriate information, which is translated into either Tamil or Sinhala and broadcast to the entire community. The information is also retained in the community database. In this way, radio-browsing helps overcome geographic, language and skill barriers to ICT use. The use of multiple media to address the digital divide is particularly effective, as “while the computer provides an access point to a seemingly unlimited amount of information via the Internet, distribution of information gleaned in this way to local poor communities can best be achieved through more traditional technologies, such as radio” (Slater and Tacchi, 2004: 12). KCRIP is an excellent example of an effective use ethos at work. The project builds the digital, human and social resources necessary for meaningful ICT access, and does it all at a very attractive price—the station’s Internet project only cost \$50,000USD to establish.

However, KCRIP is not a perfect solution. Despite the presence of trained translators, language still poses a significant barrier to meaningful ICT use (Gumucio Dagon, 2001: 132). In addition, radio-browsing is a labour-intensive solution, and necessarily limits the number of people who can access online information at any

given moment. The station, like many community media projects, also suffers from an ongoing lack of resources. In a low-funding environment, it is difficult to acquire new equipment and upgrade existing facilities.

Here, perhaps, is where effective use and technology projects can form a beneficial union. Providing \$100 laptops to Kothmale's children would inexpensively increase the technological capacity of the community, and the station's existing Internet connection could power the 'mesh' network. Guidance and training provided by KCRIP's staff and volunteers would help ensure each child has the opportunity to develop useful ICT skills. Indeed, the OLPC project could play a vital role in turning Kothmale's Internet consumers into Internet producers, and help develop a store of culturally relevant online material. This combination of innovative technology and effective use community projects has real potential to help close the digital divide.

Conclusion

The digital divide is an immensely complex problem, and requires equally complex solutions. Purely technological answers are rooted in excessively narrow definitions of the digital divide, and are unable to overcome the social and cultural aspects of information inequality. To overcome these weaknesses, technology must be fused with the idea of 'effective use' of ICTs. In other words, promoting meaningful access to digital technologies requires contextualized, culturally and socially specific strategies.

An example of an effective use intervention can be found in Sri Lanka's Kothmale Community Radio and Internet Project. By facilitating Internet access through trained volunteers, maintaining a community database and pioneering the use of "radio-browsing", the project is providing access to real opportunity, not just technology, for its community. Unfortunately, KCRIP's reach is small. There are many millions of individuals affected by the digital divide. Effective use solutions must be applied on a global scale, and OLPC's \$100 laptop has an important role to play in this international project.

The global digital divide is a serious problem that severely compromises the ability of Third World nations to access the many economic, political and educational benefits of ICTs. An effective use strategy complemented by innovative technological

solutions like the \$100 laptop provides the best hope for bridging the information gap. In this union, the industrialized world has the appropriate tools to bridge the digital divide. All that is needed now is commitment, resources, and a little visionary thinking.

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