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Abstract

Long before the term "Digital Divide" became a common term to describe gaps between the rich and poor in the effective access and use of information technology (IT), most policy makers, researchers and practitioners could at least agree on one thing: Reaching the poorest of the poor was going to be the most difficult of challenges.

Disciplines

Adult and Continuing Education | Bilingual, Multilingual, and Multicultural Education | Curriculum and Instruction | Education | Educational Administration and Supervision | Educational Assessment, Evaluation, and Research | Educational Methods | Instructional Media Design | International and Comparative Education | Language and Literacy Education

IT and Education for the Poorest of the Poor: Constraints, Possibilities, and Principles

Daniel A. Wagner¹

Hopel ess?

Long before the term "Digital Divide" became a common term to describe gaps between the rich and poor in the effective access and use of information technology (IT), most policy makers, researchers and practitioners could at least agree on one thing: Reaching the poorest of the poor was going to be the most difficult of challenges.

Even reaching the so-called 'ordinary' poor would entail challenges of electrical power, telecommunications connectivity, human resources infrastructure, and the like. Reaching the 'poorest' would be even more difficult due to wider gaps in those parameters just mentioned (DotForce, 2001). But, in addition, there would be the parameter of limitations in the human skill competencies of this target population (OECD/Statistics Canada, 1997). By human competencies, we refer here to a broad range of skills that often fall into the general catch-all term 'literacy,' but in fact include a wide variety of discrete skills ranging from reading and math, linguistic and multi-linguistic fluency, content knowledge in specific domains, eye-hand coordination, typing (and 'mousing') skills, and so forth. This list is, in reality, relatively long when operationally specified.

Limitations of human skill competencies -- some acquired in schools, others in other formal (work) or informal settings -- are a major barrier to the use of IT tools today. When added to problems of power and connectivity, mentioned earlier, the challenge becomes: you can't have IT ubiquity without literacy, nor literacy ubiquity without IT. This seeming conundrum has been difficult to address in the reality of development projects in poor countries (Perraton, 2000).

There are issues, of course, concerning the overall scale of the target population. It is commonly said that there are over 100 million school-aged children out of school, and about one billion adult illiterates, the majority of whom reside in South Asia and Africa (Unicef, 2000). Even these large (and growing per annum) numbers are likely to be a serious underestimation of literacy needs in the digital age. Indeed, if the larger set of skill competencies mentioned above were employed, along with the limited efficiency of adult literacy and second chance education programs, and the very low quality of many poor rural schools in developing countries, it would probably be more accurate to say that those in need of improved basic skills today represent between 2-3 billion indi-

viduals (Wagner, et al. 1999; Wagner, 2000). Of these individuals, we might estimate that at least half are among the 'poorest of the poor', as they will undoubtedly be over-represented by ethno-linguistic groups for whom access in the 'metropolitan' languages of the digital world (i.e. English, French, Spanish) is quite limited.

This situation, when considered in its entirety, and over decades of promises and goals unmet -- both within and across countries-- would lead the rational observer to have serious doubts that anything, and perhaps especially (relatively expensive) IT would be a foolish enterprise. Indeed, over nearly a decade of discussion, the most usual response from both international and national policy makers, as well as those practitioners 'on the ground' has often been: "Are you crazy?"

Possibl e?

Perhaps... But let us reconsider the situation in the year 2001. In many developing countries, the atmospherics concerning IT applications have undergone a dramatic change: from 'are you crazy?' to 'well, let's see what might work for us.' Even for the poorest population sectors, the benefits of IT seem well suited for coping with the problems of basic literacy and technological literacy, and enhancing the socio-economic consequences for the lives of the users. Why is this so? First, poor people in developing countries (and many in industrialized countries as well) tend to live in dispersed geographical contexts and are comprised of diverse populations of youth and adult learners, where distance education can be an effective tool. Second, there is limited and thinly distributed professional expertise in terms of teachers, which can be enhanced by IT-supplemented training. Third, because many in the target population are unable to sit in classrooms (and are too old for the formal school system), the interactive and asynchronous nature of IT can provide useful solutions. Finally, the diversity of the population of poor people (by ethnicity, language, gender, etc.) requires the kind of customer focus that, when properly employed, is potentially far more effective within the IT realm than by individual teachers. For example, even teachers that are quite skilled may lack the language skills necessary to be effective with poor, minority-language learners.

Another typical question when IT is mentioned as a 'solution' among the very poor is: How can you give every poor person

a computer, or access to the Internet? Quite right, of course. These questions are difficult to answer for development among the very poor. But they are probably the wrong initial questions. A more pertinent question is simply: What IT solutions should we consider in the near, medium and long-term with respect to poor populations with very diverse demographic characteristics?

One answer in education is to focus on the professional development and training of teachers, since the quality of teachers is known in virtually all countries (rich and poor) to be a key predictor of student learning. And, as almost any observer will relate, in poor parts of poor countries, many if not most teachers usually lack adequate training for the job they are doing. Thus, teacher training provides a relevant locus for this kind of effort, assuming the cost constraints can be met. This is so not only because training a teacher can leverage impact on many more beneficiaries, but also because it is not so difficult, even in poor countries, to bring most or all teachers to IT, rather than having to take IT out to all the teachers. Furthermore, teachers can become "intermediaries" for bridging the digital divide for the tens of millions of low-literate or illiterate youth and young adults who are in school or are in non-formal education programs in developing countries, but have had little prior access to IT.

Feasible?

Teacher training resources can be delivered through existing training institutions, and would comprise CD-ROM based materials, collaboration technology for sharing materials, pupil training resources, and culturally appropriate and multi-lingual content. Such a collaborative program has recently been launched as the *Bridges to the Future Initiative* (BFI), -- see www.bridgestothefuture.org -- which will begin soon in India, followed downstream by additional partner countries. The main overarching goal of the BFI is to try to answer the basic question posed in this short article: namely, in what ways can IT-based learning and information resources be put to service to assist the poorest sectors of populations in diverse cultural settings?

Core Principles

While the BFI partnership has some ideas on a set of specific goals (see the website above), what is most important in such initiatives is the set of core principles that will guide the project, and these we list as follows:

1. Even in poorest sectors, **IT is now too cheap to ignore**. While once it could be said that IT would take money away from other lower technologies (such as chalk and blackboards), new approaches can show cost-effective benefits when properly employed.
2. **Advanced IT tools may be relatively more cost-**

effective for the poor than for the rich. It was often thought that old IT (e.g. radio) was necessarily the best route to reaching poor people, while advanced ITs were only cost-effective for the rich. The example of the cellular phone has dispelled that thought. The Grameen Bank effort in South Asia has shown that even the poorest people can find value and resources to support a system of cellular communications. Paradoxically, in wealthier countries, one could easily argue that cell phones have relatively less value than in poor countries precisely because wealthier people have ubiquitous access to wired phones, while the cellular network is more of simple convenience than necessity.

3. **Learning technologies must have learning and content at their core** (Wagner, 2000). Many of the most egregious mistakes in the digital divide era concern an overly narrow focus on IT, without commensurate focus on learning and content. Projects within the digital divide must first and foremost be about learning, and about culturally appropriate content. No amount of hardware and access can be a substitute, and significant losses of costly infrastructure have been wasted when this principle has been ignored.
4. **IT tools must be consumer-oriented and context/culture sensitive**. Consumer sensitivity is a long-standing buzzword of marketing in the private sector, yet it seems to be sometimes forgotten in 'supply-side' projects that try to marry IT and education. Especially when focussed on the poor, it is critical to pay very close attention to consumer interests and values, which also means ethnic, language, gender, and other cultural dimensions. The poorest people in most countries have an over-representation of people from ethno-linguistic minorities. Thus, development of materials designed specifically for these people is essential, even if the startup costs are greater on a per capita basis.
5. **Literacy and technology are becoming inter-dependent**. Literacy and technology are "tools" that have much in common. Neither is an end to itself, but each can amplify human intelligence and human capability. In addition, both are rapidly becoming inter-dependent. New literacy programs need to take advantage of the power of IT, but IT work will require an ever more skilled population of workers and consumers (OECD, 2000). Societies that do not work on both of these dimensions together and with some degree of synergy will fall further behind in the digital divide.
6. **In present day economics, the J.I.T. (just-in-time) concept has taken on great saliency**, some of which has direct merit to projects like the BFI, for poor people. In addition, we must keep in mind an equivalent J.E.H. (just-enough-help) concept, which will provide IT-based

resources when and where needed for those who do not already possess IT skills and basic skills needed for ready access and use.

7. Collaboration is not just lip service in addressing digital divide problems for the poorest sectors. There are many ways to begin projects, to pilot-test them, and so forth, but programs with staying power are likely to have to reinforce existing government structures (rather than replace them), and enhance as a priority mainly those areas of public education that are most in need of assistance (e.g., teacher training). NGOs can and will be crucial in the organizational mix, but are unlikely, alone, to make a substantial difference in most countries today.

8. Furthermore, private sector involvement in Digital Divide efforts is essential in order to take advantage of latest IT tools, and more so than in other educational projects. The private sector can offer advanced knowledge concerning IT tools which will be coming down the road, and which will be able to 'pass down' large numbers of newly-obsolete PCs which can be quite serviceable among the poor. Similarly, educators (including social scientists) may have access (or can gain access) to knowledge about what is needed from the IT community in order to achieve effective educational consequences. Again, collaboration is critical.

9. In development circles, broadly defined, and especially in the Digital Divide domain, there is much talk about '**sustainability**,' which usually refers to how will recurrent costs be covered (for example, by government, external agencies, user fees, etc.). In today's environment, and especially when dealing with the very poor, the concern with sustainability can bias projects in directions that are not necessarily most effective for the end users. There is no single answer to this question, but there is little doubt that the poorest of the poor are unlikely to be able to pay user fees in the same way that the Grameen Bank model of cell phones was able to achieve over the past decade. Commercially viable IT-based projects -- such as fee-driven Internet kiosks -- will have some benefits in very poor sectors, but it is unclear whether the poorest people (without both literacy and IT) will derive much benefit in the near-term. This is an area ripe for more research.

10. Finally, to achieve impact using IT for the poorest will require a real **focus on the bottom half of the digital divide** population (the top half will take care of itself!). As we enter the first decade of the twenty-first century, it is not unusual to find digital divide initiatives that provide more access to universities, secondary school, and primary schools. However, in a great many (perhaps well more than the majority) of these cases, the

recipients are those who are already in the middle or upper classes of their respective societies -- this is especially true in developing countries where it is assumed that only middle class communities can make appropriate use of IT. The challenge, of course, is to stay focused on the poor -- otherwise the digital gap will simply increase further.

In sum, working on IT to enhance the education and livelihood of poor people is a tremendously challenging area of development work today. To be effective in this complex and ever-changing domain is more difficult than meets the eye. Yet, with a set of good principles, and a reasonable level of support, a great deal can be achieved -- indeed more than has ever been thought possible before.

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