Ambiguous Connections:

Entitlements and Responsibilities of Global Networking

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Abstract

This paper examines efforts to provide low cost Internet access devices for the poor in the light of debates about the appropriate role of information and communication technologies in development and the priority that should be given to enabling the poor to become connected to global networks. A critical analysis of recent private sector initiatives to design low cost laptop computers is offered in the wider context of the need to consider the politics of technology and the insights that can be drawn from ongoing debates about ICT4D and the need for public dialogue and evaluation of investment priorities in forums that enable the participation of the poor.

Introduction

In today's densely interconnected world, it is frequently argued that it is crucial to ensure that those people who are presently excluded from global networks become connected, whether by older or newer technologies, if they are to have opportunities to participate in development. Some even suggest that investment to achieve at least some means of connection for all is the very highest of priorities. This enthusiasm for investment in the information and communication technologies (ICTs) that support such connectivity has been especially visible in the discussions leading up to and following the World Summit on the Information Society (WSIS) in 2003 and 2005. For example, in 2005 the International Telecommunication Union (ITU 2004) launched a new initiative to 'bridge the digital divide' called *Connect the World*, an initiative in which partnerships between local actors, governments, donor agencies and the private sector are seen as central to expanding connectivity to communities by providing access to telephony or to the Internet.[1] The WSIS Civil Society Declaration (2003: 2) put poverty reduction at the centre of its concerns about the importance of investing in ICTs and extending connectivity to the poor stating that 'redressing the inexcusable gulf between levels of development and between opulence and extreme poverty must … be our prime concern'.

As an academic participant in many of the forums in which these debates have been conducted in international and national settings over the past 20 years, I have often been struck by how little of the academic critique of the ICT-driven agenda filters into these discussions.[2] During the main debates among governmental officials and others during the WSIS, there were few signs that delegates understood that the achievement of connectivity that might bring benefits from the standpoint of those who are excluded needs to be founded upon encouragement of people's capacities to choose technologies that are suited to their own needs. An emphasis on the politics of the ICT agenda and the need for a critical assessment of priorities was largely absent in the mainstream debates during the WSIS. Absent as well were signs of a willingness to assess the value of such initiatives through open dialogue aimed at evaluating people's entitlements to connectivity (Cammaerts and Carpentier 2005).

While achieving connectivity is important, it is also vital to consider the consequences that may follow and to acknowledge that these may have ambiguous implications socially and economically, depending upon the specific contexts in which such investment occurs. The consequences of investing in any type of connectivity need to be examined from a variety of vantage points if choices with respect to technologies are to be made that will give people chances to use them in ways that help them to escape from poverty and to make improvements in their lives.[3] This is by no means a new claim, but it is one that continues to need to be emphasised together with a consideration of some of the reasons for the continuing absence of a critical assessment of priorities. Many of today's ICT initiatives sponsored by the private sector or by donor agencies continue to be predicated on the assumption that the spread of technological innovations of this kind is a 'good thing' insofar as inclusiveness within such networks is assumed to be entirely beneficial for all.

The argument in this paper is that, like all technological innovations, values are embedded in ICTs and their applications and that, therefore, all forms of connection provided by ICTs must be expected to bring new ambiguities into people's lives. It follows that there is no necessary relationship between achieving connectivity – even affordable connectivity – and enabling people to make improvements in their lives, as they choose. Whether by virtue of their presence or their absence, or by the specific nature of their presence, ICTs must be understood to have a politics. They have a politics in the sense that every stage in the production and consumption of these technologies is marked by inequalities, by uncertainties and by the ways that technological innovations configure their producers and users (Silverstone and Mansell 1996). Castells (1996: 5; 2001) makes this point firmly when he says that 'technology is society'. The political aspects affect everyone, but they do so in different ways depending on the contexts in which they are introduced.

It is essential that any discussion of the priority that should be accorded to investment in ICTs include a consideration of user entitlements as well as producer responsibilities in

an effort to mitigate negative outcomes associated with such investment. If a consideration of such entitlements and the ways in which they can best be met is not present there is a high risk that such investment will simply replicate inequalities already embedded in 'top-down' development agendas. In the development context these issues lie at the heart of controversies that are apparent in ongoing discussions among those with an interest in what have become known as the 'ICT4D' or 'communication for development' fields of inquiry and action. The ongoing controversies are centrally about whether to allocate scarce resources to investment in various ICTs and content, especially in circumstances where there are many other competing priorities for those resources.

In the second section ('Technologies of Power') of this paper I consider these issues within the wider framework of theories about the politics of technology. These perspectives serve to highlight the power relations that are associated with the innovation process and to emphasise that ICTs and debates about priorities for investment should be assessed in the light of these insights. In the third section ('Technology Choices and Digital Divides'), I focus on examples of investment in 'pro-poor' ICTs that aim to extend connectivity as a means of highlighting some of the ambiguous consequences of these initiatives and to demonstrate the extent to which a critical assessment of needs and priorities is largely absent. In the fourth section ('The Politics of Choice') some the controversies that characterise recent debates concerning the priority to be accorded to ICTs for development are highlighted. One possible means of ensuring greater participation of the poor in ICT4D initiatives is offered by suggesting that an evaluation of priorities in the light of entitlements as outlined by Amartya Sen's (1999) work on 'development as freedom', provides a potential way forward.

Technologies of Power

Although considerable attention is given in the literature to the economic and social factors that influence decisions about the priority that should be given to achieving global connectivity (Mansell and Wehn 1998; UNESCO 2005), less consideration has been given to the politics of ICTs and their status as 'technologies of power' in the development context. In her review of the history of the dialogue concerning ICTs for

development, Schech (2002: 22) makes a strong plea for a consideration of the nexus between power, knowledge and technology and argues that 'efforts by international development institutions to promote development through knowledge [or ICTs] are more likely to bear fruit if they adopt a broader approach to knowledge, one that draws more actively on local and regional knowledges and understands better the multiple, transdisciplinary sites of knowledge production and the social nature of its distribution'.

A focus on power, technology and the political is evident in many studies of technological innovation. Thomas Hughes, for example, who examined the history of many different large technical systems, concluded that these systems are 'instruments of power' (Allen and Hecht 2001; Hughes 1987). Whether one is a producer of ICT systems or one is seeking to use these technologies to communicate or to exchange information, these artefacts and their contents can also be understood as 'instruments of power' because they have embedded within them certain values and preferences that may or may not be compatible with specific users' needs and requirements. Following Michel Foucault, we can similarly suggest that the power relations embedded in technologies and in the social and institutional relations around them 'determine the conduct of individuals and submit them to certain ends or domination …' (Martin et al. 1988: 2), although, importantly, those ends are not predetermined in a linear way. From these vantage points, it cannot, therefore, be assumed that connectivity to a technological system such as the Internet is automatically a 'good thing' for everyone or that all technological artefacts that can be used to achieve such connectivity should be a high priority for investment.

The question as to whether artefacts have a politics was posed in the mid-1980s by the political theorist, Langdon Winner and his answer was that they do. The intangible flows of data and information and the patterns of communication that are so pervasive today and are enabled by the Internet have a politics as well. This is especially so when these technologies are prioritised so as to provide greater access to the world's stocks of knowledge. As Winner (1986: 1) put it, 'what matters is not technology itself, but the social or economic system in which it is embedded'.

One illustration of the embeddedness of values (cultural, social, political and economic) in both technology and 'knowledge' is to be found in debates around investment in ICTs to promote education and literacy, especially as a means of tackling poverty in poor countries. In the mainstream literature on educational ICTs and the promotion of 'virtual learning' institutions, hardly any consideration is given to the appropriateness of the technologies or content which is often developed in the wealthy countries and barely customised for pedagogical purposes in distant countries. In addition, the best design of technologies in terms of cost and configuration is often simply taken for granted (West 2000). As in other domains of ICT4D there is a critical literature, but it is rarely to be found informing the decisions of mainstream proponents of the spread of educational technologies (Darking 2004; Mittra 1999). In section three of this paper, initiatives with an 'ICT for education' dimension are discussed.

Two important observations follow from this discussion. The first is that the substantial efforts that are being made to measure the direct 'impacts' of investment in ICTs may be misguided. This is because they focus primarily on detecting changes in social or economic development with little if any consideration of the politics of the social and economic system in which the technology is embedded. When the focus is on the 'impact' of a technological configuration such as a telecommunication network or personal computers, there is little chance of shedding light on the ambiguous outcomes that may accompany efforts to achieve digital connectivity. This is because studies of impacts, i.e. the search for mono or even multi-causal explanations of this kind, do not raise questions about the ambiguities that are associated with their use or provide insight into whether such technologies are used in ways that are empowering in some cases and disempowering in others. An understanding of the ambiguous outcomes of ICT investment is essential if people are to be in a position to make reasoned judgements about the circumstances in which it is appropriate to give such investment a high priority.

The second observation is that instead of giving disproportionate attention to refining qualitative and quantitative methodologies that enable us to search for the 'impacts' of

investment in ICTs, a complementary approach needs to be encouraged. In this context there is a host of critical appraisal methodologies to be drawn upon, [4] many of which locate their core concern in the conditions that are necessary to enable local citizens to experience some form of transformative empowerment. In line with some of these approaches it is similarly essential to locate questions about ICT investment within the contexts in which people are trying to bring improvements into their lives. This means more than being sensitive to local contexts and their interdependence with the global environment. It means understanding how power relations are reproduced or altered through the various partnerships that are involved in the supply of, or demand for, new technologies.

As Hickey and Mohan (2004) have suggested, the move towards 'mainstreaming' of issue areas such as investment in ICTs is often characterised as a developmental success. However, mainstreaming cannot be taken as an indictor that citizens have achieved a sense of agency in this process, nor can it be taken for granted that their rights and entitlements have been respected or, indeed, that they have achieved new political capabilities as a result of a given intervention strategy. Hickey and Mohan also make the important point that participation is often championed in the absence of a coherent and critical theory of development, one that can challenge complicity with the idea that scientific and technological innovation in the ICT area is the key to a developmental process that is empowering for citizens. What is clear in the present context is that 'top-down' technology design initiatives such as the ones examined in the next section do not meet criteria required for a transformative developmental process.

These observations are in line with those to be found in the science and technology studies literature which offers a critical assessment of the implications of science and technology for development and for democratic processes. There have been many analyses of the terms under which citizens are admitted to debates about new technologies and development-oriented measures. These may be undertaken in the name of poverty reduction, but it is often very difficult to ensure that citizen's voices are heard or to accord those voices the recognition necessary to ensure that they influence top-

down donor agency or private investor strategies (see Leach et al. 2005). In this respect the ICT4D debates are not exceptional.

In the case of the ICT4D discussion, it is helpful to emphasise the issue of user entitlements as well as whether or not the process of decision making about technology offers the potential to enhance the negotiating power of the poor. Connectivity is considered as a right or entitlement by some civil society representatives who participated in the WSIS. Their Declaration reads, in part, 'everyone, everywhere, at any time should have the opportunity to participate in communication processes and no one should be excluded from their benefits' (WSIS Civil Society Declaration 2003). Sen's (1999) arguments about entitlements provide a way of shifting the emphasis in ICT4D debates away from economic assessments of the costs of technology and towards an assessment of the politics of any particular technology solution. What is needed is a dialogue about the patterns of investment that may be valued by those who are expected to benefit. In assessing the ambiguity of ICTs it is helpful to consider people's ICT entitlements and how these might be related to development goals. Sen's concept of entitlement provides a departure point from which to debate the relative importance of global connectivity and the consequences of various alternatives. He has argued that citizens have an entitlement to acquire certain capabilities that he regards as the underpinnings of the freedom of citizens to construct meaningful lives. He focuses on those capabilities that support 'the substantive freedom – of people to lead the lives they have reason to value and to enhance the real choices [that] they have' (Sen 1999: 75).

If access to online content or having the capabilities for sending and receiving emails or text messages can be shown to amplify the 'real choices' that are available to people, then there can be said to be a justification for investing in ICTs. However, such a conclusion would not indicate the priority that such investment should receive or, indeed, what form such investment should take in terms of the range of technological alternatives (Garnham 2000). Decisions about the priority for ICT investment should depend, following Sen, on an evaluation process which, in turn, requires a public discussion in which citizens are able to participate effectively. The major challenge for researchers and practitioners who

engage in the ICT4D debates and actions is to understand the politics of initiatives in this area, something that can only be achieved through a critical appraisal of the factors influencing decisions at the local and institutional levels.

Where there are signs of understanding of the ambiguous nature of the outcomes of ICT investment for the poor, the problem is that this awareness is contained largely within a segment of the development academic and practitioner community, making little impression on those who express euphoria about the potential benefits of ICTs. The next section examines recent ICT initiatives sponsored by the private sector as a means of illustrating the extent to which top-down initiatives fail to incorporate a consideration of politics of ICTs, given the wider development agenda.

Technology Choices and Digital Divides

The politics of technology come into focus when we examine some of the implications of specific technological choices. In this section I highlight the case of choices that are being taken by technology producers in the corporate world for the design and deployment of devices to access the Internet in ways that are intended to enable the poor to achieve global connectivity.[5] The WSIS Action Plan (2003) sets targets for bringing connectivity to those who remain excluded from ICT networks.[6] To achieve these targets, one of many possibilities is to invest in lower cost technologies. At the World Economic Forum in Davos in 2004, one corporate actor, AMD (Advanced Micro Devices), a manufacturer of microchips, set out its plans to develop usable, affordable technologies and to make them easily accessible for poor people. AMD released the PIC - or Personal Internet Communicator – and announced that it hoped it would sell at about USD 185.[7] Launched in India, the PIC is now being offered to customers as part of a bundled Internet service that includes broadband access and a variety of financing options is available to people on limited incomes.

In a similar vein, the chairman of the MIT Media Lab, Nicholas Negroponte, announced a USD 100 portable computer for the developing world during the WSIS in 2005.

Although he reported promises of support from companies such as AMD, Google, Motorola, Samsung and News Corp, no firm commitments have been made. In order to achieve the scale economies necessary to produce the 'green machine' or laptop computer[8] at low cost, governments will have to commit to purchasing a million machines, assuming they do go into large-scale production.

AMD's PIC and Negroponte's low cost 'green machine' are not the first attempts to market low cost means of achieving connectivity for those on very low incomes (Fonseca and Pal 2003). Innovative technologies such as these are being introduced with great optimism in the hope that that they will provide a part of the solution to digital divides that continue to exclude many of the poor from access to global networks. However, history shows that optimism about technology always needs to be tempered with caution (Kling 1996, Mansell and Steinmueller 2000).

What are the consequences associated with some of these efforts to enable low cost Internet access devices to contribute to education and literacy as a means of reducing poverty? Taking the case of the PIC it is clear that both economic and political factors are influencing the outcomes in ways that make it difficult to imagine that the new devices will reach the very poor at all. In India selling the PIC to the poor means marketing a product costing USD 250 to those with incomes of between USD 1,000 and 6,000 annually; at the lower end, around USD 2.00 per day. Cable & Wireless in Jamaica is charging USD 15.00 per month over two years for the PIC. A broadband subscription is also needed costing USD 29.95 per month. Thus, the total cost to the user in the first year is USD 540.00. This is a considerable amount for a potential user if his or her annual income is about USD 1,000. In addition, there appears to have been little attempt to coordinate this initiative with investment in local digital content or new electronic services despite the fact that AMD has promoted the PIC, in part, based on its educational value.

In the case of the 'green machine', Negroponte argues that 'when we make this available, it is an education project, not a laptop project' (Twist 2005). As a top-down corporate –

government partnership in investment, there is no evidence that consideration has been given to a critical appraisal of how the learners – the children – in this case, are to incorporate their access to the laptops and the associated learning resources (local or global) into their everyday lives or, indeed, of the ways in which this might empower them in a manner which is consistent with poverty reduction. These questions are not raised or tackled in the context of these kinds of initiatives.

It is for this reason that scepticism is appropriate with respect to these kinds of initiatives. Assessments of whether such initiatives are an appropriate means of tackling digital divides or poverty need to be made in the light of other development priorities. Some analysts assert that digital divides, even in poor countries, are simply a feature of standard economics or sociology of the diffusion process whereby there is a time lag between initial take-up and the spread of new technologies such as ICTs – left to itself the market ultimately will reduce or eliminate any gaps in connectivity as long as appropriate institutional and governance features are in place (World Bank 2005).

Others observe that connectivity requires a number of interdependent resources including low cost terminals, adequate and affordable telecommunication infrastructure, sufficient levels of awareness and skills, a critical mass of users to enable individuals to benefit from network externalities and the availability of content that will motivate users to seek connectivity in the first place. If the various components of this system of technical and non-technical resources are not in place, digital divides will persist. Therefore, measures are needed in all of these areas. This is the case, but the argument here is that there also needs to be a critical appraisal of user entitlements and an evaluation of the potentially ambiguous outcomes of such investment.

While measures may be taken to address these issues, on their own they cannot address the politics of connectivity that have been outlined in the preceding section. With its top-down origins the PIC and similar designs for Internet connectivity devices are unlikely to be responsive to the many reasons that people continue to be excluded from the potential advantages of connectivity, however it is achieved. For both children and

adults, the question is whether these ICT initiatives are likely to be seen by them as being responsive to their needs. The problem is that the politics or the values embedded in the technology solutions that are being advocated through such initiatives are not considered by their proponents.

Given the scale of production that is necessary to achieve the low cost of supply, governments and potential users will need to commit strongly to these technological designs. For governments in low income countries, although providing technologies for children to gain access to the Internet to support education may be important, there will inevitably be competing priorities for expenditure such as health or environment protection. In cases where judgements are made to support investment in these low cost solutions to digital divide problems, further questions need to be raised about whether the solutions are the best means of responding to the entitlements of the users.

There is little if any evidence of reasoned debate about the politics of these technologies in the forums in which decisions are taken. The corporate players participating in the development and marketing of these devices are motivated by their forecasts of returns on their investments. Governments are motivated by the potential to provide new learning opportunities for children, but there is no questioning of how that learning will be integrated within the local knowledge-base and contexts in which children live their lives. For those who do use these technologies to access the Internet, consideration must be given to whether the content of the learning resources available through the web is appropriate and whether such access harbours further ambiguities. The absence of an inclusive debate about needs and requirements sets the conditions for a potential mismatch between technological choices and the interests of the users. In the next section, some of the reasons for this absence of critical debate are highlighted.

The Politics of Choice

One factor that may be contributing to the continuing absence of an inclusive and reasoned debate on many aspects of the ICT4D debates is the controversy with respect to

whether the potential gains for the poor associated with global connectivity are so substantial that a clear case can be made for 'mainstreaming' investment in this area. Not surprisingly, questions about whether a high priority should be given to achieving connectivity to global networks involve perceptions of the kinds of power relationships that are associated with the opportunities such investment might create.

The views of participants in such debates tend to align with whether they adhere to the dominant, 'modernising' development agenda (Schech 2002) or to alternative views of the developmental project such as that espoused by Escobar (2005). To illustrate these controversies, I draw upon an analysis of one of many discussions that have taken place in online forums in recent years. The purpose of this section is not to present a full textual analysis using the tools of discourse analysis and only a few highlights of the analysis of the postings is presented here.[9] Thompson (2004) following Escobar (1995) draws attention to the way in which particular strategies and actions associated with development become 'normalised' through advocacy by the wealthy proponents of investment. Thompson suggests that there is a need to problematise developmental discourses and to investigate the assumptions that are embedded within them. The texts generated by an online discussion about ICT4D and the role of communication in development can similarly be considered in terms of the participants' understandings about power relationships, development and the role of ICTs.

The participants in this instance were mainly representatives of civil society organisations, including community based organisations, donor agencies, academics and students, but there also were a few private sector entrepreneurs, journalists and consultants. The vast majority were based in the wealthy countries in North America or Europe. A wide range of issues was discussed including methodologies for evaluating the 'impact' of ICTs, the purposes of evaluation and the reasons for the non-cumulativeness of learning about the experiences of ICT intervention strategies. Across the more than 220 postings over three weeks, there was evidence of a consensus on the need to involve local communities more directly in planning and decision making about ICTs.

One issue that was particularly visible in the thematic analysis of the postings concerned differing perceptions of the way that technology is offered as a solution to poverty. One contributor asked, for instance, 'what is the 'truth' about technology?' In her capacity as a community-based specialist, she suggested that 'the received truth about the impact of ICT is that it is a blessing, technology put to the task of aiding humanity at a time of impending crisis. I'm not so sure … This is a package deal. Western culture and values come packaged together with the English language'.

This view is reminiscent of the politics of technology and the embeddedness of values within both technology and the organizational interventions that are made to establish connectivity. There were numerous illustrations of this viewpoint, but there were also postings which suggested participants had a view of technology as a neutral tool that can be implemented in the service of any development agenda as long as that agenda is clearly articulated. On the whole, however, those joining this dialogue appeared to be aware that there are many vested political and economic interests in claims for priority to be given to ICT investment.

Another theme in this online discussion concerned the issue of what should count as 'participatory decision making' in the context of ICT4D. For example, a contributor representing a civil society organisation observed that effective participation in making choices about whether to invest in new technologies, how much and to what end, will always result in a situation where 'participation challenges power …' Choices about ICTs and connectivity have the potential to challenge power relationships and may not therefore be welcomed by those whose positions in the hierarchy of power might be challenged.

An academic contributor (not the present writer) observed that the politics of developments in ICTs always must be taken into account. 'I believe a great segment of the … community has a very hard time dealing with the political implications of this type of approach to development'. Optimism about the benefits of technology was expressed

by one representative of a civil society organisation who said ‘there is now sufficient experience at village level of all forms of communication systems (including digital technologies) to demonstrate the parameters of a new paradigm’. In this posting there was no hint of the possibility that such investment can lead to ambiguous outcomes.

A United Nations agency officer countered the view that ICT investment necessarily creates new beneficial opportunities for the poor by adding that, ‘… many of these [ICT4D] interventions amount to nothing more than 'participatory manipulation’. The development of new Internet access devices by major corporations or by major research and development labs such as the MIT Media Lab are clear illustrations of ‘top-down’ processes initiated with the expectation that whatever technology emerges, it will be responsive to the needs of the poor.

The ambiguous nature of the outcomes that may be associated with technology investment was also present in this online discussion, particularly with respect to whether it is feasible to account for direct impacts of ICT investment – whether positive or negative. For instance, a civil society organisation spokesperson argued that attempts to demonstrate the impacts of digital technologies are ‘… as pointless as trying to count how many angels can dance on the head of a pin’. In this discussion, there were some adherents to the view that ex ante methodologies for evaluating the impact of investment in ICTs are all that is necessary to determine whether investment has been responsive to the needs of the poor. However, the view that a broader vision is needed to assess what should be done in terms of investment seemed to attract greater support overall. One US-based academic said that ‘…only by incorporating attention to economic structures, political processes, social norms, cultural histories, media institutions, and more’, can we make these choices. Here again there is an awareness of the need to consider politics of technology alongside other dimensions so that needs can be understood and reflected in whatever strategies are adopted.

In spite of the fact that this particular online forum was hosted by institutions who some would argue are the main proponents, and initiators, of the top-down strategies that most

of the participants in this debate wanted to challenge, critical comments on current practices and views about the benefits of ICTs were offered by those operating from both within and outside these institutions. This observation is important because it highlights the absence of homogeneous viewpoints within and outside such institutions about the ICT–development nexus.

In this particular online forum there was a strong awareness of the crucial importance of examining the wider politics of technology in the context of initiatives to establish connectivity for the poor. These participants mainly stressed that the appropriateness of such initiatives must be assessed in terms of the implications for the human dimensions of people's lives and their experiences in the wider context of a developmental agenda that is defined in response to people's needs and expectations rather than solely by a 'modernising' agenda for economic growth.

The imperative that ran throughout this discussion was that 'we must … avoid giving the impression that information, knowledge and communication are magic wands'. Most of the postings in the discussion were consistent with the lessons that can be drawn from the broader literature on the requirements for critical participation in the development agenda. In the academic context there are many case studies and an increasing number of publications in the ICT field that espouse positions that are similar to those expressed here.[10] In order to move away from a technologically deterministic position, it is necessary to decompose what is meant by ICTs in a given context. If this is not done, it may appear that any investment that enables connectivity is a valid strategy. Most providers of these technologies give no consideration to how they align with the entitlements of the poor, i.e. their requirements to live the lives that they choose, or how these might be met, if at all, by enhanced connectivity to global networks. Before deciding that benefits are likely to flow from investment in a given configuration of ICTs it is essential to understand specifically what such connectivity will mean.

Conclusion

By coupling a discussion of people's entitlements to global connectivity with a consideration of the politics of technology and their ambiguous consequences for the poor, there is a better likelihood of enabling people to play a greater role in deciding when to give priority to ICT investment. As Escobar (1995: 20) has so acutely observed, 'narratives are always immersed in history and never innocent'. He argues that much of the discourse on development is complicit in the continuing production of underdevelopment. In the case of the ICT4D initiatives many strategies for investment favour dominant discourses about the importance of access to scientific, technical and related forms of knowledge which are themselves infused with unequal power relationships and exclude the poor because of their lack of relevance to their everyday experiences and needs (Schech 2002).

This paper has highlighted the importance of examining the wider politics of technology in order to consider how future initiatives to address digital divides may have a greater chance of reducing poverty. It is imperative that actions in this area acknowledge that technologies are not 'magic wands'. While there is a discussion of the need to take the politics of technology into account in some quarters, it remains very difficult to design and implement technologies that are responsive to people's needs in poor communities. This is partly because the results of critical appraisals continue to be discussed mainly in places which are not those in which investment decisions are taken. Sen's concept of entitlements and his call for evaluation and dialogue provide a potential departure point from which to consider the relative importance of achieving connectivity for the poor. Those setting out strategies in the corporate, government and donor agency communities could take more responsibility for ensuring that such a reasoned decision making process is in place in the ICT4D context. So far there are few signs that they are cognisant of the need to do so.

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1 The 'digital divide' refers to the phenomenon whereby people are unable to achieve connectivity. The notion has been criticised for placing too much emphasis on technological solutions (see Mansell 2001; Warschauer 2002). There are many sources of statistics which document the uneven spread of ICTs, see for example, www.internetworldstats.com.

2 During the past 30 years the labels used to highlight the importance of the ICT investment agenda have changed. References to the Information Society and the Knowledge Society encapsulate the notion that successful development requires a high priority to be given to achieving connectivity that enables access to 'information' or 'knowledge' (for a discussion see Mansell and Wehn 1998, Schech 2002, and UNESCO 2005).

3 Connectivity can be established using technologies from telephony to the Internet, to radio and broadcasting. Connectivity requires the use of some type of 'terminal' and this paper focuses on one of these .

4 See IDRC's resources on evaluation and impact assessment in the ICT field, http://www.idrc.ca/en/ev-9977-201-1-DO_TOPIC.html. There are debates about appropriate methodologies, some of which claim that substantial local participation is essential.

5 This section is based on press reports – references to which are available from the author and my participation in events at the WSIS 2005.

6 The United Nations Millennium Goal 8 includes a reference to targets for the spread of ICTs.

7 The PIC allows customers to access an Internet browser, email, word processing and spreadsheet applications and its operating system uses Microsoft Windows.

8 The 'green machine' refers to a coloured laptop prototype running a Linux-based operating system with smaller processors and slower memory than a standard laptop and powered by a wind-up crank.

9 An online moderated discussion, 'Measuring the Impact of Communication in Development Projects and Programs', January-February 2005 was hosted by the Department for International Development in the UK, the World Bank, the International Development Research Centre, Canada and others. All comments were extracted and anonymised. The texts were analysed systematically using heuristic themes which included learning, technology and power, institutions and power, citizenship, participation, development, and epistemology. See Bauer and Gaskell (2000) for a discussion of the requirements for discourse analysis and Thompson (2004) for a detailed critical analysis of discourse that mobilises the ICT for 'development' agenda as espoused by the World Bank and others.

10 Many of these can be found in the *Information Technology for Development* (Wiley) and the *Information Technologies and International Development* (MIT) journals and in the proceedings of IFIP WG 9.4 on the social implications of computers in developing countries.