



May 2004

INFORMATION TECHNOLOGIES AND EDUCATION FOR THE POOR IN AFRICA¹

Recommendations for a Pro-Poor ICT4D Non-Formal Education Policy

Dan Wagner (ILL, University of Pennsylvania)
Bob Day (CSIR, South Africa)
Joseph S. Sun (SEAS, University of Pennsylvania)

EXECUTIVE SUMMARY

More than half of Africa's youth and adults do not have basic literacy skills and/or have not completed primary or secondary school. It is deeply concerning how little serious attention has been paid to the potential ways in which ICT can enhance such skills, as part of a *pro-poor* model of ICT for Development (ICT4D). Such work is crucial if the goals of Education for All (EFA) and the Millennium Development Goals (MDG) are to be achieved. The present effort, "*Information Technologies and Education for the Poor in Africa*" (ITEPA), is designed to focus attention on what is being and has been attempted in this domain in some of the poorest communities in Africa.

As part of the ITEPA methodology, information was gathered on previous, on-going and planned projects in the Africa region (and in South Africa and Ghana in particular) through a case study approach. Data and information were gathered through field visits and surveys, to investigate and evaluate how such projects are 'put together' and what hurdles must be overcome. ITEPA focused on collecting quantitative and qualitative data on various types of ICT-based education initiatives for out-of-school youth and adults, with the support of DFID/Imfundo (see Acknowledgements).

Following a presentation of the field-based findings and general discussion, the report provides broad conclusions, a set of recommendations, and thoughts for the future. The main conclusions deal with the following issues: moving towards pro-poor ICT-based sustainable development models; why local content is central to African ICT4D; how informational needs are critical both for individual development (broader literacy) and for project success; the growing role of capacity building in Africa; the need for credible action research; and the increasing need for multi-level coordination.

¹ The research and fieldwork of this report was supported by Imfundo/DFID, with additional support from Learn International, and the International Literacy Institute, with further support for production and dissemination from TECH21 (under contract from the U.S. Department of Education/Office of Vocational and Adult Education (ED-01-CO-0139) to the University of Pennsylvania, and the Spencer Foundation.

A substantial list of recommendations is provided, including the following:

- A better understanding of the concept of ‘broader literacy’ is needed, that goes beyond the traditionally limited concept of functional reading and writing.
- Integration of ICT and education issues across various government departments (national and provincial) is needed in most African countries.
- All projects need the early development of a shared vision between those funding the project, those running it, and those intended to benefit from it.
- ICT projects require a sophisticated balance between creating awareness of new possibilities generated by ICTs and taking into account the context and needs of the intended beneficiary communities.
- Further action research is needed on how ICT can support existing local information and communications flows generally, and on local initiatives in particular that build on social entrepreneurs’ ability to respond to local needs.
- A more balanced approach is needed by international organizations and donors working at the policy level to influence the national decision makers, loosening restrictions and opening the doors for ICTs to expand into the poorest communities.
- Experts need to focus less on ‘delivering’ quick, superficial implementation and more on developing *credible* capacity and a defensible knowledge base concerning outcomes.
- A climate is needed in which innovations, appropriate pilot projects, and other micro-level interventions can flourish and add value locally, nationally and globally.
- In many pro-poor projects, local content needs to be given a much more central role; access is only one part of the process of ICT4D, but the last ‘3 cranium inches’ is where the learning dimension takes place.
- The long-term issue of holistic telecommunications reform must be given higher priority.
- Policy focus needs to shift beyond trying to implement (i.e. scaling up and force-feeding ‘successful’ small-scale pilots) towards *creating an enabling environment*.
- Small scale testing is an important and cost-effective strategy for innovation in ICT4D, but the temptation to ‘scale up’ prematurely and/or inappropriately must be avoided.
- Major initiatives need a clearly defined *development* phase, so that project continuation does not depend on short-term ‘success’ or ‘failure’ at project onset.
- Pro-poor approaches to ICT4D are neither quick, nor simple, nor cheap – but they are critical to achieving the major goals of EFA and MDG.

Table of Contents

Executive Summary	2
Acknowledgements/ List of Abbreviations and Acronyms	4
List of Annexes	6
1. ITEPA: The Background	7
2. Literacy, ICT and the Poor in Africa: A Synthesis	10
3. Policy Perspectives and ITEPA Field-Based Findings: South Africa and Ghana (and Other Countries)	20
4. Thematic Findings on Motivation, Inequities, and Pro-Poor Policy: Discussion of the data gathered	36
5. Looking Back, Looking Ahead: Conclusions and Recommendations	38
Annexes	45

Acknowledgements

The present report was contracted by Imfundo: Partnership for IT in Education (DFID) to Learn International, a non-profit PVO located in Philadelphia PA, and conducted under the joint leadership of Dr. Dan Wagner (Professor and Director, International Literacy Institute (ILI), University of Pennsylvania, USA; wagner@literacy.upenn.edu), Dr. Bob Day (Council for Scientific and Industrial Research (CSIR), SA; bday@scientia.co.za), and Joseph S. Sun (Academic Director, School of Engineering and Applied Sciences (SEAS), University of Pennsylvania; sunj@seas.upenn.edu), during the period 2002-2003. At Learn International, David Faw played a key role in management and administration of the project finances. Several other specialists contributed in important ways to the present report, including: data gathering/interviews by Ricardo Diaz (University of Pennsylvania), Kofi de Heer Menlah (GIMPA, Accra), and Thandeka Kunene (independent consultant, South Africa) as well as editorial support by Megan Doherty; Peter Benjamin, Neil Butcher and Tina James provided expert and in-depth advice and criticism on the project questionnaire, and their own views on the use of ICTs in Africa; in addition, more than two dozen specialists who completed in-depth one-on-one interviews with the ITEPA team (and who, by common agreement are not named in this report); finally, a number of African specialists provided e-mail responses to a shortened electronic questionnaire. Thanks also to Tim Unwin whose leadership at Imfundo was invaluable, and who also provided helpful editorial suggestions on an earlier version of this report. Without the help of all these individuals, the present report could not have been achieved. It should also be noted that Section 2, which provides an overview of main issues is drawn in part from recent reviews by Wagner and Kozma (2003), as well as from Day and Grewan (2003). Naturally, the present authors take responsibility for all that is presented herein, including any errors of fact or interpretation. This paper is being distributed by Learn International, DFID/Imfundo, and as an occasional paper of the ILI, as a collaborating agency with support for production and dissemination from TECH21, under contract from the U.S. Department of Education/Office of Vocational and Adult Education (ED-01-R-0023).

List of Abbreviations and Acronyms

ABET	Adult Basic Education and Training
ADF	African Development Forum
AVU	African Virtual University
CAI	Computer-Assisted Instruction
CBO	Community-Based Organization
CD-ROM	Compact Discs – Read Only Memory
CLTC	Community Learning and Technology Center
CSF	Community Services Foundation
DFID	Department for International Development (UK)
DVD	Digital Video Discs
ECA	Economic Commission for Africa
EFA	Education For All
EU	European Union
GDVP	Ghana Digital Villages Project
GMoE	Ghana Ministry of Education
GO	Government Organizations
GoG	Government of Ghana
GoSA	Government of South Africa
HEI	Higher Education Institution

HIV/AIDS	Human Immuno-deficiency Virus/Auto-Immune Deficiency Syndrome
HP	Hewlett Packard Company
IBM	International Business Machines
ICT	Information and Communications Technology
ILI	International Literacy Institute (University of Pennsylvania)
IPR	Intellectual Property Rights
IRI	Interactive Radio Instruction
ISP	Internet Service Provider
KNUST	Kwame Nkrumah University of Science and Technology
LDC	Less Developed Country
LOI	Language of Instruction
LSM	Learning support materials
MDG	UN Millennium Development Goals
MPCC	Multi Purpose Community Centre
MPTC	Multi Purpose Tele-Centre
NEPAD	New Partnership for African Development
NFE	Non-Formal Education
NFE-CD	Non-Formal Education and Community Development
NGO	Non-Governmental Organization
OAU	Organization for African Unity
ODL	Open Distance Learning
OECD	Organization for Economic Co-operation and Development
OOSYNET	Out-Of-School Youth Network
OSS	Open Source Software
PC	Personal Computer
PENN	University of Pennsylvania
SADC	Southern African Development Community
SANLI	South African National Literacy Initiative
SMME	Small, Medium and Micro-Enterprises
UDS	University for Development Studies
UN	United Nations
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISA	University of South Africa
USA	Universal Service Agency (South African Quango)
USAID	United States Agency for International Development
UW	University of Winneba
VSAT	Very Small Aperture Terminal
Web	World Wide Web

List of Annexes

Annex 1. Tables (A, B, C): Summary of Surveys from South Africa, Ghana and Other African countries

Annex 2. South Africa: Survey compilation of key findings

Annex 3. Survey Results of Three Specialists

Annex 4. Findings from Other African Countries - Electronic Survey Findings

Annex 5. Full ITEPA Survey Questionnaire (face-to-face)

Annex 6: Short (e-mailable) ITEPA Survey Questionnaire

Annex 7: Workshop Report, ITEPA-Ghana (Feb 2003)

1. ITEPA: THE BACKGROUND

1.1. ICT, the Poor, and Literacy in Africa

Relatively little attention has been paid as yet to the multitude of ways in which ICT can enhance literacy and livelihood skills of out-of-school youth and adults in Africa. Such work – essential so that constrained resources and investments can be maximized – is crucial if the Millennium Development Goal (MDG) of universal basic education and literacy is to be achieved. This research and evaluation study, *“What works” in Information Technologies and Education for the Poor in Africa* (or *ITEPA*), is designed to focus on what works currently, and what is likely to work in the future, in providing appropriate educational resources to the poorest communities in Africa. When using the terms poor, poorest or “pro-poor” to define particular population groups in Africa, we are utilizing these terms in the most conventional sense, that is, those persons who are likely to be the most disadvantaged in terms of education/literacy), wealth/income, and social status (as related to ethnicity, language, gender, and so on). In the ITEPA study, the most straightforward algorithm to determine a pro-poor (or pro-poorest) policy is one that addresses those individuals who have not gone beyond primary school or who could not successfully demonstrate basic literacy skills.² In practical terms, this type of definition of the poor would encompass nearly a third or more of the combined population youth and adults in much of sub-Saharan Africa.

The ITEPA project was designed both to review existing information and to undertake on-site (and electronic) interviews with key actors on how ICT can best be used for poor and out-of-school youth and adults in Africa, with a particular focus on South Africa and Ghana. ITEPA seeks to address five core strategic issues that have been identified by Imfundo as priority areas:

- Education and skills training for out of school children and youth
- Universal primary education
- Reduction of illiteracy
- Gender equality in education
- Use of ICT to deliver poverty alleviation

ITEPA was undertaken by several international and African consultants, in liaison with ILI and African partner agencies, and builds on the several years of preparatory work and funding provided by other public and private agencies. Wherever possible, ITEPA has sought to leverage Imfundo- and DFID-supported activities in South Africa and Ghana.

1.2. Goals and Design Methodology

As part of the ITEPA methodology, the ILI and its partners gathered information on previous, on-going and planned projects in the Africa region through a case study approach. Data and information were gathered through workshops, field visits and surveys, to investigate and evaluate how such projects are ‘put together’ and what are the hurdles that must be overcome.

² There is growing evidence that many individuals who have completed primary school do not possess basic literacy skills (nor the ‘broader’ literacy skills elaborated below), due to the poor or limited quality of their education. See Section 2 for more on this point.

ITEPA focused on collecting high quality quantitative and qualitative data on various types of ICT-based education initiatives. The main components of the ITEPA terms of reference were to include the following in the present report:

- (a) Identify current and past information on ICT-based NFE, basic education and literacy tools;
- (b) Evaluate material as part of a meta-analysis (synthesis review) of findings on best practices;
- (c) Provide recommendations on the future development of ICT-based NFE training materials.

The ITEPA study seeks to understand the current state of practice in the use of ICTs among the very poor in Africa, especially in non-formal education and community development (NFE-CD) contexts. Data, information and anecdotal material were gathered from a wide range of African stakeholders using workshops, interviews and questionnaires (see Annexes 5, 6, and 7).

Specifically, the study seeks to identify:

- NGOs, GOs, and international agencies that are working in NFE-CD that are actually implementing ICTs or seeking to do so;
- Current state of ICT activities in NFE-CD, and seek examples that might serve as “Best Practices”; and
- Current obstacles and challenges facing ICT utilization in NFE-CD; and opportunities for future directions.

Survey questionnaires were used both for face-to face interviews, as well as for electronic responses, in order to provide comparative data across persons and settings (as much as possible). The face-to-face interviews were particularly informative, since the interviewees were encouraged to express their experiences, concerns and hopes, sometimes in significant detail. The researchers have attempted to retain the original spirit, even the words, of the interviewees wherever possible (see the Annexes).

In Ghana, the primary focus of data and information gathered was from policy and decision makers, as well as the managers of specific ICT initiatives (i.e., mainly from managers and decision makers). By contrast, the focus of the South African inputs was from either the local project leaders working with beneficiaries at the ground level of ICT initiatives, as well as from a few top specialists with considerable expertise.

1.3. Structure of this report

The paper begins with a synthesis of the broad situation of literacy, and the educational use of ICTs in Africa for the poorest sectors of the population. The following section provides both policy and field-based findings from South Africa, Ghana and elsewhere. The final two sections comprise a discussion of the main findings, and finally, a set of conclusions and recommendations.

2. LITERACY, ICT AND THE POOR IN AFRICA: A SYNTHESIS

2.1. Changing definitions of literacy³

Despite considerable effort over the last half-century, there has been disappointing progress in overcoming the fundamental problems of literacy in both the developed and developing worlds. When UNESCO was established shortly after World War II, literacy was a key component of its mandate, and, over the decades that followed, literacy has been included on the agendas of nearly all the international and bilateral agencies. Indeed, literacy has been emphasized as a global problem by many international conferences since the mid 1970s. The 1990 UN World Conference on *Education for All* (EFA) in Thailand was particularly important, since it resulted in a number of educational goals related to youth and adult education, including to:

- reduce the number of adult illiterates to half of the 1990 level by the year 2000, while reducing the male-female disparity;
- improve learning achievement to an agreed percentage of an appropriate age cohort (which might vary from country to country); and
- emphasize a new approach to learning that focuses on measurable learning achievement (rather than mere class attendance or participation).

Worldwide, a disproportionately small 5% of national education budgets is spent on the much higher proportion of the population that is functionally illiterate. A recent UNESCO review⁴ estimates that there are nearly 862 million illiterates in the world above the age of 14, over 60% of whom are women. Some 27% of the total population in developing and underdeveloped countries is illiterate, although some improvements in literacy rates have been noted since 1990. These same analyses show the astonishing contemporary reality that *more than half of Africa's youth and adults do not have basic literacy skills and/or have not completed primary or secondary school.*

The evolution of the definition of literacy is, in itself, a fundamental issue, and suggests that the “African literacy problem” may be even more serious than that described above. At the 1990 EFA World Conference, the limited traditional view of literacy was broadened to include basic learning needs or competencies, i.e. mastery of the ‘3Rs’ together with other knowledge, problem-solving and life skills.⁵ Useful contemporary definitions fit the above model, and describe literacy in relative rather than absolute terms:

³ Sections 2.1 and 2.2 borrow substantially on the ideas developed in Wagner, D. A. & Kozma, R. (2003). *New technologies for literacy and adult education: A global perspective*. Technical report. Philadelphia: International Literacy Institute/University of Pennsylvania.

⁴ UNESCO (2002). UNESCO Education Statistics. Paris: UNESCO. See also Wagner, D. A. (2000). *Literacy and Adult Education*. Global Thematic Review prepared for the U.N. World Education Forum, Dakar, Senegal. Paris: UNESCO.

⁵ ILI/UNESCO. [Principal author: D. A. Wagner] (1999). *Assessing basic learning competencies in youth and adults in developing countries: Analytic survey framework and implementation guidelines*. ILI/UNESCO Technical Report. Philadelphia: International Literacy Institute.

“The ability to understand and employ printed information in daily activities, at home, at work and in the community – to achieve one’s goals, and to develop one’s knowledge and potential.”⁶

With the advent of the United Nations Literacy Decade (2003 – 2013), the International Action Plan⁷ calls for an even broader, renewed vision of literacy, stating that:

“literacy for all is at the heart of basic education for all and that creating literate environments and societies is essential for achieving goals of eradicating poverty, reducing child mortality, curbing population growth, achieving gender equality and ensuring sustainable development, peace and democracy.”

In addition, the Action Plan specifically includes information literacy in this vision:

“... it has become necessary for all people to learn new literacies and develop the ability to locate, evaluate and effectively use information in multiple manners”.

How do ICTs impact on this vision, both in the immediate and longer terms?

2.1.1. Literacy and Technology: Increasing Interconnections

The arrival of personal computers (PCs) a quarter of a century ago turned everyone (theoretically) into a potential computer user. It was inevitable that these PCs would be linked to the Internet, which had been established in the USA in the 1960s and 1970s. In the 1980s and ‘90s, the PC - Internet combination converted the Internet from a tool used only in military and academic circles into the global phenomenon we are still trying to come to terms with today. This, in turn, has changed the nature of the PC (and its most popular applications) from being predominantly a processing tool into a powerful and highly flexible communications platform.

In the context of the PC - Internet combination, three powerful trends appear to be driving the information revolution:

- *Cost of communicating.* The transmission cost of sending digital data has decreased by a factor of 10,000 since 1975. This is largely due to technological developments in fibre optics enabling considerable bandwidth at lower cost, and micro-electronics that have reduced costs of telephone networks by replacing electromechanical switching. Smart wireless technology is also having a huge impact as evidenced by the phenomenal growth in global cellular telephony;
- *Power of computing.* Computing power per dollar invested has also increased by a factor of 10,000 since 1975. Integrated circuits combined with the increase of transistor density on microchips and significant gains in the economies-of-scale in the production of these components are largely attributable for this progress.
- *Convergence.* Analogue technologies are being replaced with digital technologies. Using a

⁶ OECD/Statistics Canada. (2000). *Literacy in the information age*. Paris: OECD.

⁷ UN. (2002). United Nations Literacy Decade: Education for all. International plan of action: Implementation of General Assembly Resolution 56/116. New York: UN.

single binary code system, digital technology is capable of dealing with voice, video and computer data over the same network; whereas in the era before convergence, independent carrier technologies were necessary.

Taken together, these trends have given rise to the merging of the computing and communications sectors into a single sector referred to as the Information and Communications Technology (ICT) Sector.

We have already seen that literacy is a multi-faceted concept with an ever-broadening definition. ICTs may have positive or negative impacts on differing sectors and populations of today's world. However, there is little question that ICT is impacting the world's populations in differing ways. The inevitable combination of literacy provision and ICT, therefore, has created a matrix full of challenging potential. Nonetheless, it is problematic for the wide range of stakeholders involved in global and local literacy issues (whether policy makers, researchers or practitioners) to understand and stay abreast of the immediate and potential impact of ICTs, especially given their ever-changing nature. The possibility of global and high-powered (Western) intimidation may delay or even prevent significant benefits that can be provided for the poor, particularly to those most in need, and this is one important reason why the ITEPA study was undertaken at this moment in time.

How are ICTs currently being used to support the acquisition of literacy and basic skills? At this stage, the discussion will remain within the OECD's definition of literacy set in 2000 (OECD, 2000), as described above. Within this context, two approaches have dominated the application of ICTs to support the acquisition of traditional literacy skills – ICT-based instructional tools, and ICT-enhanced distance learning.

ICT-based Instructional Tools: In this approach, the capabilities of ICTs can be used to *deliver instruction*. Unlike earlier technologies, the growing interactivity of ICTs provides an input-processing-output capability that can be used to develop computer-based tutorials that support the cognitive processes involved in reading and understanding text. New developments in ICTs are likely to continue to increase their impact via such interactive tools.

One of these emerging technological advances – of particular interest in multilingual regions such as in Africa – is human language technology. Speech recognition software now runs on high end PCs, and can process input from a variety of users with little or no training. Also, text-to-speech technology is beginning to find commercial applications which can read text from e-mails, web pages, or typed text. These technologies have only recently become commercially available, but, as with similar technological advances in the past, their costs are dropping quickly, whilst their computing power is growing. They hold particular promise for the near term in the developing world because of long standing concerns regarding the language of instruction (LOI). In rural Africa, the importance of literacy in the local language is clear, yet many argue that the provision of such programs is impractical, and that international languages are more cost-effective. Problems associated with the provision of literacy programs in local LOIs include:

- poor and insufficient materials in local LOIs;
- lack of research-based materials in local LOIs; and

- teachers who are poorly trained in local LOIs.

The development and application of ICT-based human language technology tools now offers the real opportunity to address cost-effectively these problems, and to give learners and teachers the option of language of choice.

ICT-enhanced Distance Learning: In this approach, ICTs are used for *learning at a distance* when and where sufficiently trained teachers and other resources are lacking. The earliest distance learning programs in the developing world were correspondence based and mostly at the tertiary level, e.g. in the Philippines (in 1940), South Africa (in 1946), and Indonesia (in 1955). More recently, developing countries have used radio and television to broadcast literacy programs to remote populations.

Distance learning is playing an increasingly important role in developing countries. There is a growing realisation that mass provision represents the only viable solution to many aspects of the global education (and literacy) crisis, operating as a major alternative form of education. However, there is a grave danger that many forms of ICT-enhanced distance education currently being practiced will be misinterpreted as the ‘massification solution’, since, according to Dhanarajan⁸ “...there is as much ignorance among many in education as among those outside it about what distance education can do and cannot do, what does and does not constitute good practice in distance education, its efficiencies and governance.”

2.1.2. ICTs and a Broader Concept of Literacy

The foregoing discussion has adhered to a traditional definition of literacy which, in effect, limits the role of ICTs to the provision of a set of potential delivery and instructional tools, used to help people acquire the skills associated with traditional notions of literacy. However, an even broader vision emerges when literacy and ICTs are considered in the light of the knowledge society which is fundamentally changing most aspects of human activities (work and leisure) in both the developed and developing worlds.

The United Nations Development Program (UNDP) has produced a model⁹ of the multi-factorial relationships between technology, skills development, and economic development, where:

- a country’s ICT investments can directly enhance the capabilities of its citizens;
- increased skill capacity can, in turn, support the further development and increase the productive use of the technological infrastructure;
- the growing sophistication of the skill base and the technological infrastructure can lead to innovation and the creation of new knowledge and new industries;

⁸ Dhanarajan, G. 1999. “Higher education through open and distance learning.” Forward in Harry, K (ed): *World review of distance education and open learning*. London: Routledge.

⁹ UNDP. (2001). *Human development report 2001: Making new technologies work for human development*. New York: UN.

- new knowledge and innovation can support the growth of the economy that, in turn, provides resources needed to further develop the human, economic, and technological infrastructure and the welfare of society.

In this vision, *ICTs are an integral part of an information-literate society* and personal participation in this technology-knowledge-innovation-economic development cycle begins with literacy. Hence, literacy includes not only the decoding and comprehension of text but the ability to access, analyze, evaluate, communicate, and use information to solve problems and create new knowledge. ICT, therefore, plays a much more fundamental and diverse role than merely providing a set of delivery and receptive mechanisms. This *broader* vision of literacy better addresses the needs and realities of youth and adult literacy learners and users within communities that can generate, share, and use knowledge for the benefit of all.¹⁰

2.2. Literacy and ICTs in Sub-Saharan Africa: An overview

In the previous section, ICTs were seen as having a growing impact on global literacy issues in two roles. First, ICTs can provide more flexibility in the ways in which literacy programs are designed, developed, and delivered in response to a wide variety of learner circumstances. Second, ICTs and information literacy are becoming an essential joint component of the basic skills set needed by all people, including those in the poorest and most remote communities.

How is Sub-Saharan Africa responding to these ICT challenges? It is useful to consider the answer from three approaches:

- the ways in which ICTs are impacting on the design, development and delivery of traditional literacy programs;
- what is being done with regard to ICT and information literacy; and
- how a broader concept of literacy is being realized in Africa

2.2.1. ICT and Literacy Programs in Sub-Saharan Africa

In most African countries there are insufficient data on actual literacy rates, and challenges still remain in finding meaningful ways to measure progress in terms of literacy on a country-by-country basis.

There are many initiatives through bilateral and multilateral institutional arrangements that are in place, including NEPAD, UNESCO, EFA, ECA, and the OAU. In 1999, the U. N. Economic Commission for Africa (ECA) hosted the African Development Forum (ADF), to establish an African-driven development agenda that reflected the consensus of the major partners and that led to specific programs for country implementation. The theme of ADF(1999) was “The Challenge to Africa of Globalization and the Information Age.” The ADF ‘99 Post-Forum Summit considered concrete action programs covering four theme areas:

- youth and education;
- health services;

¹⁰ OECD/Statistics Canada. (2000). *Literacy in the information age*. Paris: OECD. Also, Wagner & Kozma (2003).

- e-commerce, and
- ICT policy.

The three sectors under the youth and education theme, named the African Learning Network, are school-based programs (SchoolNet Africa), programs for out-of-school youth (OOSYNET), and university-based programs (VarsityNet).

Prior and post ADF, other donor initiatives have been ongoing in Africa:

- UNICEF has established a youth rights Internet project, Voices of Youth¹¹, operated within the framework of the UN Convention on the Rights of the Child to provide learning materials and activities (including photo essays, quizzes, case studies, discussion on social issues and youth rights issues. One of its most frequent activities is organizing discussion forums (youth-youth and youth-policy maker) via web discussion (message boards) or chat. Topics have included HIV/AIDS, Water Rights, Gender Discrimination, Armed Conflict and Peace, Inter-country Adoption, Religion and Tolerance.
- Childnet International is a non-profit organization which seeks to promote the interests of children in international communications. Childnet's priority is to ensure that governments, industry and child welfare groups work together at the strategic international level to protect children by:
 - Promoting wide access to new technology and quality content for children.
 - Seeking to spread good practice in promoting media awareness and Internet skills to those who guide children.
 - Challenging governments and industry to develop child friendly media policies.

There is an impressive list of further donors, corporations and NGOs that are working on ICT based African initiatives that involve literacy (either explicitly or implicitly) and include youth, schools or education institutions. The list includes: the International Institute for Communications Development; the International Education and Resource Network; Imfundo; Schools Online; World Links; World Bank; SchoolNet Africa; International Literacy Institute; 3Com; AT&T; British Aerospace; Cisco; Compaq; Hewlett-Packard; Discovery; IBM; Microsoft; the African Youth Initiative; Schlumberger; CAB International; and the Commonwealth of Learning. However, there is growing concern that there appears to be a considerable lack of co-ordination between these initiatives, as well as a limited differentiation of the challenges and appropriate interventions. As a result, there may be wasteful duplication of efforts, as well as exclusion of specific interventions for explicit, pre-defined sub-groups like out-of-school-youth or ethno-linguistic minorities.

Radio and television, as broadcast technologies, are attractive in Africa because they can leverage costs to address the needs of a large number of learners over distance and, with rebroadcast, over time. Historically, educational broadcast programs started off in "talking head" (simply showing a person talking without context) format and they were designed to distribute information to large numbers of students very inexpensively. However, the lack of interactivity

¹¹ <http://www.unicef.org/voy/>

and, in the case of radio, the lack of visuals significantly limits the instructional support that can be provided to students.¹²

More recent developments have found ways to “work around” some of these limitations. For example, interactive radio instruction (IRI) uses a methodology that requires learners to stop and react to questions and exercises through verbal response to radio characters and engages them in group work and physical and intellectual activities while the radio program is on the air.¹³ In South Africa, rural students participating in IRI showed higher gains, relative to control groups, than did participating urban students, and girls gained more than boys. Probably the best-known application of educational television is *Sesame Street*, which is preparing children in 140 countries around the world to begin school and literacy. In South Africa it is called *Takalani Sesame*, and in Egypt it is known as *Alam SimSim*. In Egypt, more than 90% of children under the age of eight (over 4 million children) in urban areas and 86% in rural areas watch the show. Significantly, 54% of mothers regularly view the series.

While broadcast radio and television have had a long history in distance education, the use of the computer to create virtual classrooms at a distance is quite new and remains at the experimental stage in most African countries. However, at the postsecondary level, the African Virtual University (AVU), organized by the World Bank in 1997, has established 31 learning centres at 17 currently participating African universities. Its initial results, based on international, synchronous video conference based lectures, were disappointing. However, the ICT strategy has now broadened to include a combination of online materials, online chat, video broadcasts, CD-ROMS and DVDs in both synchronous and asynchronous modes.

2.2.2. ‘ICT Literacy’ in Sub-Saharan Africa

Over the past three decades, the convergence (both in terms of technology and markets) of telecommunications, the mass media, networked computing environments, and the Internet has changed the way the developed world works and plays. This ICT based “network society” is seen as the generator of a “new economy”, manifested in such icons as Silicon Valley and the “Asian Tigers.” However, almost all of these dramatic changes have been taking place in the developed world (with few new exceptions, such as in South India), whilst the developing world, and especially Africa, appears to be falling ever further behind. This “digital divide” will continue to widen as long as Africa is excluded from the network society and the new economy.

A recent study for UNESCO by one of the authors (BD) of ICTs and the African tertiary sector (i.e. the development of “e-Campuses” or “Virtual Campuses” in Africa) involved both study tours to a variety of higher education institutions (HEIs) in Senegal, Ghana, Ethiopia, Kenya, Uganda and South Africa, as well as desk based investigations of Tanzania, Mozambique, Mauritius, Madagascar, Zimbabwe and South Africa. One of the areas of investigation included

¹² SchoolNet SA, 2 August 2002, *Audit of major ICT Projects in South African Schools*. Produced for the World Economic Summit.

¹³ Bosch, A., Rhodes, R. & Kariuki, S. (2002). Interactive radio instruction: An update from the field. In W. Haddad (Ed.), *Technologies for education: Potentials, parameters, and prospects* (pp. 134-143). Paris: UNESCO.

“ICT literacy and the role of the tertiary sector - staff, students, and broader society”.¹⁴ Some of the relevant findings of the report are summarized below.

National policies or initiatives to promote ICT literacy throughout broader society, including the poorest communities were not reported. However, some governments are promoting ICT access and literacy for the general public via initiatives like the promotion of school and community centre connectivity (particularly via VSAT), and the stimulation of vocational ICT training at high schools. The participants recognised that although the HEIs were not yet playing a central role in promoting universal ICT literacy into the rest of society, they should be doing so, since they arguably have the best capability. Although a few HEIs are collaborating with school connectivity initiatives (e.g., SchoolNet), generally, HEIs are not yet involved in coordinated strategic initiatives to provide the general public (particularly the poorest communities, women, and the disabled), with access to PCs and the Internet, to ICT literacy courses, or to other ICT enhanced services.

With few exceptions, Africa’s HEIs (whether large or small, public or private) have no coordinated institutional policy or strategy for promoting ICT literacy of staff or students, let alone the needs of the general public. The lack of ICT literacy within the executive management teams of most large African HEIs may help explain this, as well as emphasising the importance of promoting universal ICT literacy. Conversely, the majority of students, irrespective of their course, put computer labs as a high priority, linking the spread of universal ICT literacy with the availability of PCs.

In general, large public HEIs in Africa lack sufficient network infrastructure, PC laboratories, and quality ICT instructors to provide most staff or students with adequate access. The set up, upgrade and maintenance costs are crippling most HEIs, seriously inhibiting further growth of these facilities. However, the new opportunities being offered by open source software (OSS, particularly Linux) are being recognised more widely.

In contrast, many medium sized private HEIs promote ICT literacy both for staff and all students, often emphasizing e-mail which has become a major administrative/communications tool for these more cost disciplined institutions. Most are successfully providing ICT literacy courses to their entire student body, having already achieved the ‘acceptable’ 1/20 ratio via PC laboratories which also provide Internet access. In addition, these PC labs are often made available to the general public after hours and at weekends, using a variety of business models, including ‘cyber-cafes’. Therefore, these medium sized African institutions are often more advanced than the larger public HEIs in the drive for universal ICT literacy, albeit for non-strategic reasons.

Concerns have been raised regarding the poor quality of some of the ICT literacy training courses that are commonly offered in Africa. It was also emphasised that ICT training is of little value when not quickly and regularly reinforced. The best results are said to be produced in teacher training colleges, where young potential teachers (especially science teachers) adopt ICTs much more readily than without ICTs. The issue of teachers (especially older teachers)

¹⁴ Unpublished draft report prepared by Bob Day for UNESCO.

acting as a bottleneck, rather than providing a “multiplier effect” in disseminating ICT skills to the young, merits further investigation.

In general, young people (including pre-teens) were found to assimilate to PCs and become ICT literate faster than many adult trainees. Indeed, the best of these youngsters can extract significant value out of even the oldest machines by investigating their inner workings rather than simply using them to run the usual applications. In some cases, this experience has led to ‘reverse mentoring’, where ICT literate students help with the learning of ICT illiterate teachers and other adults.

2.2.3. Realization of a Broader Concept of Literacy in Africa

In facing the challenges around an expanded vision for basic education, the SADC Protocol on Education and Training has as its ultimate objective progressively to achieve equivalence, harmonization and standardization for education and training systems in the SADC region.¹⁵ The preamble of the SADC Education Protocol points out that “no SADC Member State can alone offer the full range of world quality education and training programs at affordable costs and on a sustainable basis”. To strengthen regional cooperation, the SADC Education and Training Sector adopted the idea of establishing regional “Centres of Specialization” and have launched a feasibility study on an intra-regional skills development program.

SADC has recognized that their current education and training systems are rapidly becoming obsolescent, particularly because of developments in ICTs and globalization.¹⁶ Furthermore, SADC faces a conundrum in that the very foundations for an information society, basic literacy, numeracy and technology skills are lacking in most SADC member countries. The need for appropriate, rapid, and purpose-directed education and training in order to make people productive and competent, cannot be over-emphasized, no matter if the learner is a subsistence farmer in a drought-stricken land or an information worker in a highly industrialized country. The need remains to be able to sustain oneself more effectively, to complete tasks more competently, and to improve one’s position or standard of living, to mention only a few. Education needs to support both employment and self-employment.¹⁷

In the previous sections it has been argued that a broader concept of literacy involves each individual being empowered to become active members of the emerging information society. Although these insights are beginning to be included in policy processes in some parts of Africa, e.g., SADC, the evidence is that it is yet to filter down to the implementation level, either in the education sector, or the ICT industry. Throughout Africa, ICT and information literacy continue,

¹⁵ Agneta Lind, DRAFT 29 November 2002, *Adult Basic Literacy and Education (ABLE) Policies in an International Perspective*. Keynote paper for International Conference on ABLE in the SADC Region, 3 – 6 December 2002, University of Natal, Pietermaritzburg South Africa.

¹⁶ Deputy Minister of Education South Africa, Mr. Mosibudi Mangena, 3 December 2002, At the International Conference on Adult Basic and Literacy Education in the SADC Region, 3 – 6 December 2002, University of Natal, Pietermaritzburg, South Africa.

¹⁷ John Aitchison, 2002, *Adult literacy and basic education: a SADC regional perspective*. Centre for Adult Education, University of Natal: p.1

in general, to be regarded as peripheral issues, especially when considering the poorest and most remote communities.

However, history shows that the sustainable development of these communities will not happen unless and until it is actively driven by individuals and groups from within them. This concept is inherent in the UNDP's technology-knowledge-innovation-economic development cycle, where the informed and educated individual is central to development. In addition, the United Nations Industrial Development Organization (2002) encourages developing countries to take the "high road" to development not only by building new institutions and infrastructure, but also by providing the support needed to create new skills, information, and capabilities at all levels of society.¹⁸ A recent World Bank (2002) report argues that skills needed for lifelong learning not only prepare citizens for competition in the global market but also improve their ability to function as members of the community, thereby increasing social cohesion, reducing crime, and improving income re-distribution.¹⁹

¹⁸ United Nations Industrial Development Organization [UNIDO] (2002).

¹⁹ World Bank (2002). *Lifelong learning in the global knowledge economy: A challenge for developing countries*. Washington, DC: World Bank.

3. POLICY PERSPECTIVES AND ITEPA FIELD-BASED FINDINGS: SOUTH AFRICA AND GHANA (AND OTHER COUNTRIES)

3.1. South Africa

Many varieties of non-formal education (NFE) and literacy programs for out-of-school children, youth and adults exist in today's South Africa, but these provide less than a quarter of the total need for further education services. Few of the teachers in NFE, alternative, second-chance schools and programs, and continuing education centers have ever received substantive in-service teacher training, and only a minimum of pre-service training. The Government of South Africa (GoSA) has declared raising literacy levels in South Africa as one of its top national priorities, with a goal toward providing youth and adult learners in poor communities with basic literacy and numeracy skills. Furthermore, in November 2001, a new Information and Communication Technology Education Strategy was launched in order to advance all sectors of education, including literacy and adult education.

3.1.1. Literacy in South Africa

South Africa has a long history of adult literacy initiatives²⁰ and some key policy documents for ABET Policy Reform by the post-Apartheid government since 1994 include:

- The African National Congress's Implementation Plan for Education and training of April 1994 produced by the Centre for Education Policy Development.
- The Education White Paper of March 1995.
- The National department of Education's: "A national adult basic education and training framework: interim Guidelines" of September 1995.
- The research project report of 1996 on Adult Basic Education and Development, compiled by the Department of Education, Congress of South African trade Unions, Development Bank of Southern Africa, the Centre for Education Policy Development, and National Literacy Co-operation
- The Department of Arts, Culture, Science and Technology Language Plan Task Group's final report of 1996: "Towards a national language plan for South Africa".
- The Department of Education draft policy document of 1997: "Adult education and training in South Africa", as well as its draft: "A four year implementation plan for adult education and training: provision and accreditation".

Despite this impressive list of adult literacy activities, GoSA estimates today that 3.5 million adults over the age of 16 have never attended school. Another 2.5 million adults have had some schooling but were ill taught or lack practice and reinforcement and so their reading and writing abilities have atrophied. Hence, roughly 6 million South African adults today are either illiterate or 'low literate'.

²⁰ Aitchison J.J. 1997. *A review of adult basic education and training in South Africa*. A Working Paper. Florida State University:

In 2000, the ABET Act and the regulations for a National ABET Board provided a legislative framework for the establishment, governance and funding of ABET centers. Through the Adult Education and Training Multi-year Implementation Plan (MYIP), the qualities of both ABET provisioning and delivery have been actively addressed. The National ABET Board monitors the progress of the MYIP, and acts as an advisory body to the Minister. In the same year, the Department of Education also launched the South African National Literacy Initiative (SANLI) to oversee the establishment of a voluntary service to reach the millions of illiterate adults. The engine for this literacy campaign is a partnership between UNISA's Adult Basic Education and Training Institute and the Department. They aim to achieve a target of 2 million adult learners completing the literacy program by 2004.

Today, ABET and literacy is provided through many South African government departments, donors, agencies, NGOs and corporations. Most projects in South Africa have yet to be evaluated for their contribution to broader literacy issues. Unfortunately, linkages between theory and practice have not been developed in an integrated and holistic manner. In addition, formal links do not exist with other related programs, e.g. poverty relief; land reform; agriculture; water and sanitation; entrepreneurial skills development.²¹

Given the above variety of ABET and literacy projects being deployed in South Africa, a report in 2000 identified certain general observations²², including:

- The predominance of English, both as a subject and as a language of instruction, is overwhelming.
- The extent of numeracy and mathematics ABET learning support materials (LSMs) is a source for satisfaction, since there was virtually no material in this area before about 1994. The quality and number of programs is impressive.
- Many courses supply facilitators' guides of varying usefulness. In spite of these, the evaluations indicate that the finest materials, including those created for distance education, cannot do without adequately trained and supported ABET facilitators.
- The existence of Unit Standards and outcomes based assessment has had a strong positive influence on the design and quality of LSMs.
- There is a strong tendency to publish ABET LSMs as substantial sets of workbooks. Whether this is necessary, desirable or affordable seems seldom to be considered.
- Most workbook-based programs have self-sufficiency, which is useful, yet problematic in not opening up to learning beyond the course.

It is clear from the numerous ABET LSMs that ICTs have been neglected in low-literate groups, because of the perceived high-costs in low income areas and their limited profit potential.

Youth organizations in South Africa are said to have played a significant role in South African political liberation. However, some organizations mobilize youth around political issues while

²¹ Ikhwelo Consortium Pilot Projects Impact Evaluation March 2002. Ikhwelonet Consortium, Project Literacy, AED, Department of Education, USAID.

²² SIDA (Swedish International Development Agency), Independent Examinations Board, August 2002. An Evaluation of South African ABET learning Support Material: <http://education.pwv.gov.za/?src=doea&xsrc=abet>

others mobilize them around sports and religious issues. Yet other organizations such as Soul City and Love Life are trying to reach out to youth on HIV/AIDS and health awareness. Importantly, these latter organizations are said to be more in-touch with youth at grassroots levels than are the political youth associations.

Those interviewed in the ITEPA study generally felt that very few youth development organizations were mobilizing sufficiently youth around economic issues or ICTs for development. Most are geared towards life skills and basic computer literacy. The role of youth organizations in supporting youth ICT skills development is nonetheless essential, particularly since the school system is considered unable to cope alone; the quality of career guidance is seen as poor; and tertiary educational institutions are seen as out-of-touch with the needs of the job market and employers. One expert said that while many of the issues about failures in youth ICT training provision were systemic, it did not mean that youth organizations had to wait for this to change before doing something. It is suggested that they transform themselves organizationally and begin addressing the issues in proactive and solution-oriented ways.²³

SchoolNet SA (a South African non-profit involved in ICTs for schools) has done much to catalyze ICTs in school system in SA, mainly in secondary schools. The numerous projects and teachers trained have served as a stimulus for growing awareness of the multiple benefits of ICTs in schools. SchoolNet SA has connected hundreds of schools to the Internet, and trained thousands of teachers in relevant ICT skills; nonetheless, the leadership of this same organization is trying to broaden its impact with increasing focus on out-of-school youth and adults.²⁴

Emerging evidence from research studies demonstrates that the opportunities which ICTs present to create associations and make appropriate contextualized meaning are enhancing learning. ICTs in a relevant educational context can expand access to new information and support efforts to add meaning and opportunities to people's lives. Yet, there is complementary evidence that poor learning can also result from the inappropriate use of ICTs. SchoolNet SA has observed that poorly managed schools and/or poorly designed programs can derail excitement for learning that the introduction of ICTs had originally introduced.²⁵

3.1.2. ICTs in South Africa

In general, the ICT corporate industries have not been major players in the economies of most African countries, which tend to be consumers (and only in large organizations and elites), rather than producers to any significant degree. Africa, led by South Africa, has been importing technologies from the developed world and employing them in a variety of ways for more than two decades, but with only negligible impact on the exclusion and poverty of the vast majority of its people. South Africa has the largest ICT Industry in Africa. In 2002 it was the 20th largest country market for ICT products and services, accounting for 0.6% of worldwide revenues. If the

²³ Youth, Entrepreneurship and Information and Communications Technology Training Research Project: Data Report. Youth Development Trust: www.ydt.co.za

²⁴ SchoolNet SA and the ILI are collaborating on the *Bridges to the Future Initiative* (BFI) in South Africa. The BFI seeks to provide relevant local language content to out-of-school youth and adults, as well as teacher training. See www.bridgestothefuture.org.

²⁵ Personal observation, Rod Grewan, SchoolNet SA.

telecommunications market is included, then the total ICT market in 2000 was R 79 billion (about \$13 billion). But some may well question whether this constitutes a real indigenous ICT industry.

The corridor between Johannesburg and Pretoria can be described as an ICT cluster, centered on MidRand. However, very few of the ICT products are South African in origin, so do not contribute directly to increase local productivity. South Africa's ICT industry is made up of multiple outposts (satellites, or fully dependent subsidiaries) of mostly multinational companies who find MidRand the best environment from which to sell on their products (developed elsewhere, and mostly for different markets), primarily into the developed component of the South African market, but also into any organization in the rest of Africa that has the funds. Much of the income derived, therefore, is siphoned back into other components of the Multinationals elsewhere in the world, draining the already depleted African economy.

There is significant evidence that growth of South Africa's ICT industry (and particularly its indigenous component) is being seriously stunted by the insufficient supply of appropriately qualified, trained and/or experienced people. It is estimated that up to 165,000 students will be needed to address ICT skills shortages in the near future²⁶. A recent study²⁷ undertaken by the Department of Trade and Industry which examined the rate of diffusion of ICT within eight industry sectors showed that higher education institutions (HEIs) were hardly considered by industry as sources of information or training in ICTs.

The fundamental message is that South Africa's current education system, given the pressures described above, and compounded by the dynamism and expansion of the ICT 'realm', cannot alone even begin to satisfy the wide range of training and education needs that are required in the immediate future. And this particularly includes ICT literacy. Hence, there needs to be an holistic national strategy to address this special need, otherwise the full potential of ICT will not be achieved. There is a growing belief that the extensive inclusion of Open Source Software (OSS) at all levels of ICT education and training has become essential in South Africa's current circumstances.

It seems clear that South Africa (and other African nations) can only create genuinely indigenous ICT industries by actively producing, and in large numbers, innovative ICT based solutions to satisfy genuine, local, developing world needs. In a sense, MidRand may be somewhat counter-productive in achieving this goal. It "looks good," it impresses locals and visitors alike. It is useful to have, and creates some benefits. But, MidRand is not, and has not been set up to be, an indigenous ICT industry.

3.1.3. Findings from field interviews in South Africa

²⁶ SANEC (2001-2002). South African Netherlands Chamber of Commerce Trade Directory - Economic profile South Africa.

²⁷ Esselaar P., James, T., Miller, J. and Sibthorpe, C. (July 2002). *ICT Diffusion and Applications in Eight Industry Sectors in South Africa*. www.tips.org.za/research/dtipsp.

Table 1A (see Annex 1), provides a summary of the main comments derived from the interviews undertaken during the ITEPA project in 2003, mainly through one-on-one interviews. A summary follows, but the reader is encouraged to read the Annex which provides a rich source of detailed observations.

How does one determine which ICTs are most effective, and for which set of problems? The beneficiaries, especially from the poorest communities, have little if any experience with ICTs, nor can they appreciate all potential benefits. Hence, beneficiaries are highly dependent on the project designers and implementers. This puts a major responsibility on the shoulders of these external agents, who should ensure that they clearly understand the problems, circumstances and potential demand of the community in question. Further, ICTs cannot be the starting point for successful development initiatives in poor communities. Instead, appropriate ICTs, often in combination, become apparent only after a variety of other processes (described in detail in Annex 1) have been initiated. These include:

- building a relationship with and consulting the target beneficiaries;
- needs analysis, involving both communities and target groups, depending on the project;
- identifying possible solutions, and the possible ICT components of those solutions;
- awareness creation of the potential benefits of ICTs within the community;
- identification and empowerment of local champions and implementers;
- evaluation of the status and effectiveness of existing or potential ICT infrastructure;
- developing clear, realistic, but flexible project design(s), co-owned by all stakeholders;
- monitoring and evaluation as fully funded ongoing components of each project, and responding early with necessary changes to problems and community feedback.

Once ICTs are introduced, the approach should be 'trial-and-error' with a willingness to listen, learn and change. If future initiatives are set up systematically following the above guidelines, comparability of tools and approaches will be much easier to achieve, and benefits should multiply accordingly.

Most South African projects have manually collected data (e.g., learner records, courses undertaken and subsequent career progress). Generally, data gathered are limited, incomplete, and often inadequate for decision making. At the individual project level, good information is emerging about use of ICTs with case studies providing rich anecdotal information about project successes and failures. Data at a systemic level, however, remain of much lower quality. Much more work needs to be done on continuously assessing the broader impact (both direct and indirect) of each project on not only the individuals using the services provided, but also on the wider community. Many projects may fail because of unrealistic goals and objectives imposed by donors or other external agents. Measurable targets are often lacking, and meaningful data are not obtained to determine what a project has achieved. Systemic monitoring, evaluation and digital data collection need to be built into the initial project design for all projects.

The role of 'vision' and the quality of that vision seems critical to actors in the success of projects. The respondents agreed that the overall vision for all initiatives involved the improvement of the quality of life, poverty alleviation, and sustainable development through ICT, with particular emphasis on the provision of quality, equitable and relevant education for rural areas. Too many projects fail because the vision is established without reference to the

context of implementation. Instead, projects need to develop a shared vision between those funding the project, those running it, and those intended to benefit from it. Sadly, without high-level political commitment even well-intentioned and insightful vision at lower levels may be irrelevant. An illustrative example may be seen in the NEPAD e-Schools initiative. The vision is being evolved centrally, and could become a major catalyst for driving rollout of ICTs into education systems by providing high-level political commitment. However, the critical next challenge is to develop a much more detailed and inclusive vision, particularly by involving the expertise and experience of the many national SchoolNets.

Since the mid-1990s there have been many ICT for development projects designed with a significant ICT bias, often with little understanding for the demand-side needs. But this is a complex issue, since people in poor and disadvantaged communities have had little opportunity to experience or understand the potential benefits of ICTs. Thus, ICT projects require a sophisticated balance between creating awareness of new possibilities (a benign ‘push’ process) and, once that understanding is established, encouraging the communities to ‘pull’ by articulating their needs, taking context into account. Recently, there seems to be an increasing recognition of the limitations of supply-side initiatives, and towards ICTs becoming integrated (as an enabler) into *demand*-led programs in such areas as the marketplace environment, civic participation, human rights, and job creation. One of the best examples of demand-led initiatives is in the economic marketplace where telecentres, teleboutiques and cybercafes are sprouting up even in very poor areas. Nonetheless, few donors have been able to create demand-driven ICT programs for the poor.

Instead of specifically targeting the poorest communities, ICT projects are generally still aimed at the ‘easiest to reach’ populations, such as urban, peri-urban, or more easily accessible communities (including schools), primarily because donors generally avoid high risk projects. Little research is being done on how ICT can support existing local information and communications flows generally, and on local initiatives in particular that build on social entrepreneurs’ ability to respond to local needs. There is a need for tightly designed longitudinal action research measuring impact over longer periods (5+ years), focusing on the core problems of the poor (which are not about the ICTs themselves) and then assessing objectively what role different ICTs might play in solving those problems.

Broad strategic thinking in Africa about the many potential benefits of ICTs in education is in its early stages. To date, most work has been done by early adopters persuading others that investment in educational ICTs is justified (e.g. SchoolNets, WorldLinks). Holistic strategies are needed to overcome issues such as:

- strategic conflicts between donor agencies and national government education agencies;
- uncoordinated approaches of the international development and donor communities;
- lack of integration of ICT and education issues across various government departments;

Generally, many project sponsors still do not sufficiently understand and respect the needs and capabilities of local communities. However, the few designers and implementers who genuinely consult and involve the target beneficiaries show that it is more than possible, with beneficial results. It is generally found that donors and project implementers may have unrealistic expectations of ICT diffusion and adoption in communities. Experts need to focus much less on

‘delivering’ in the short-term, and much more on the more expensive and time consuming development of local capacity.

All respondents surveyed said there is a need for balance between collective/community involvement in projects compared with individual involvement. Although the community focus increases chances of sustainability and has broader impact, the focus on empowering individuals is powerful in creating examples or champions. Nonetheless, it is important that the desire to create champions does not instead create elites which will divide rather than unite the community. There is a growing tendency to use participative rural appraisal approaches to project design, which suggest growing interest in community involvement. But this is expensive and slow, and does not always guarantee success. The need is to create a critical mass of local champions who can become responsible for balancing community and individual needs.

The question of whether ICTs have positive social impacts and real development outcomes is complex. Data are presently insufficient, and there is little understanding of long-term outcomes and impacts. However, the general response from the communities studied was that ICTs *do* have many positive outcomes. Many obstacles in achieving success appear to stem from: (a) having no ‘big picture’ vision of what can/should be achieved, or (b) not viewing ICT realistically as being only one of many enabling mechanisms, or (c) both.

Nonetheless, numerous specific negative outcomes of ICT-based projects were cited in interviews, such as:

- ICTs were imposed without the involvement of the community;
- ICT projects often reinforce dependencies, a difficult cycle to break;
- initiatives were used to dump outdated/surplus/unusable ICTs;
- ICTs were used to train just a few of the poor, creating another elite class;
- funds were spent prematurely to fit the artificial time frames of governments and/or donors;
- rural communities are unrealistically expected to adopt ICTs in a few months;
- promising projects died because the funds dried up, or because of isolation.

It was often commented that greater collaboration between the private sector, public sector, donor community and poor communities could add substantial value and reduce conflict at the local level. However, such collaboration is as strong as its weakest link, and poses the danger of over-complicating projects by involving too many partners. There are many barriers to such collaboration in South Africa and more generally, including:

- vested interests and (sometimes) hidden agendas;
- government departments, with separate budgets, are seldom rewarded for collaborating;
- too few national ICT strategies to tie together initiatives meaningfully;
- too little regional coordination, despite NEPAD and SADC; and
- donor fragmentation.

Regarding pilot projects, there is general agreement among those surveyed that there have been, and are:

- too many pilot ICT projects where donors are pursuing their own ‘disparate’ interests;

- too much focus on initial one-off pilots, with little shared learning;
- too many pilot projects where designers or implementers avoid the responsibility of ensuring that their projects are sustainable.

Paradoxically, there is also a general belief that pilot projects (or something similar) are needed to test innovative ideas, as well as to gain experience and identify what works and what does not work, in preference to the flawed ‘big bang’ approach. Perhaps instead of pilots, all major initiatives need a clearly defined development phase, but holistically structured such that there is a move towards wider implementation and long-term sustainability.

Respondents believe that there are probably many examples across Africa of innovative, pilot ICT projects (e.g., phone-shops, cyber-cafes, telecentres privé) that have received little or no external funding, attention, or policy support. However, an innovative research agenda (not project specific research) that looks beyond the obvious would be needed to uncover them.

To provide a viable basis for sustainable development, there are major systemic requirements beyond the basics of buildings, security, water, electricity, transport, roads, and telephone lines. The difficulty of obtaining connectivity in rural areas (low bandwidth, and high cost) depends on the long-term issue of telecommunications reform, and the freedom to experiment with innovative ICT solutions (especially wireless, and OSS). Commitment is needed to ICTs for development across a wide range of sectors, not just within government. Policy focus needs to shift away from trying to implement (i.e. scale up successful small-scale interventions) towards *creating an enabling environment*.

Currently, South Africa is in many ways an ICT ‘colony’ of the USA and EU. The ICT sector is not very ‘indigenous’ in terms of location of production, the scarce skills base, and most of the models for ICT usage. The need is to redress the balance by creating the capacity to develop indigenous ICT products and services (independent of the multinational ICT companies), as well as stimulating the demand for such services. A re-evaluation is needed of the regulations and barriers that hinder South African people, especially the poorest, from initiating indigenous ICT-based solutions. Initiatives which introduce local-language based ICT applications are likely to be a first step towards creating such an indigenous ICT sector.

An important final point is that, according to several survey observations regarding reaching the poorest of the poor, local champions appear to be operating more as social entrepreneurs in support of the ‘local information society’ model. The flexibility and sustainability of such models indicates that they should be recognized as essential subcomponents of any development framework coordinated with achieving EFA and MDG goals.

3.2. Ghana

3.2.1. Background

Ghana has made literacy a significant national priority, and has received substantial World Bank support over the past decade for one of the most prominent literacy initiatives in Africa. However, the effectiveness of such programs has been in question. At the same time, the growth

of ICT in Ghana has put it at the forefront of ICT innovation on the continent. Clearly, before ICT can fulfill its potential in Ghana, the barriers associated with the lack of basic literacy needs to be overcome.

The Government of Ghana (GoG) and the Ghana Ministry of Education (MoE) recognize the potential of ICT to contribute to development and are keen for its introduction at all levels within the education sector. A draft ‘Information and Communication Technology Policy Framework’ produced by the GoG and MoE cites the harnessing of ICT as a means to increased basic enrollment, improved learning outcomes in education and increased adult literacy. In addition, the policy report ‘E-Readiness Strategy for Ghana’ sanctioned by the National Information and Communication Technology Policy and Plan Development Committee of the GoG in 2002 represents a forceful attempt to position Ghana to take full advantage of the information economy in the 21st century.

In 2003 alone, numerous national- and international-level workshops and conferences on ICT for education and development were held in Ghana. Even so, most of these gatherings included little emphasis on ICT for the most vulnerable in Ghanaian society, and with the exception of the (Imfundo-funded) ITEPA Workshop that was held in Accra in February 2003, none focused exclusively on the topic of ICT for the poor (See Annex 7). Participants of the ITEPA workshop, comprising leaders of NGOs as well as representatives from government, tertiary education institutions, multinational organizations, and funding agencies agreed unanimously that integrating ICT instruction and usage for NFE as well as for community development is crucial for many persons in Ghanaian society in order to “survive” in the future. Some expressed passionately that public policy is not sufficiently responsive to the issue of access, especially in terms of infrastructure (i.e. rural electricity and telephony). In addition, others raised the question of what are the productive uses of ICT infrastructure for NFE and community development, and for the poorest communities. Once determined, policy must then be developed to enable resources to work toward achieving practical outcomes that effectively use ICT for educational and productive purposes.

3.2.2. Information Gathering in Ghana

Empirical information for the ITEPA-Ghana study was gathered through a Workshop that was held in Accra in February 2003 (see Annex 7), as well as through a dozen field surveys that were collected to investigate the specific practices that are currently taking place in multi-purpose community telecenters (MPCTs), as well as to document the thoughts and opinions of key individuals who are actively involved in directly overseeing these centers or who are involved in policy setting and program development roles that impact on NFE-CD activities in Ghana.

3.2.3. Sectoral Findings in Ghana

3.2.3.1. Governmental Sector

Ghana’s MoE Division of Non-Formal Education Division (NFED) is the main governmental entity charged with the responsibility of providing basic education to out-of-school youth and adults, primarily through functional literacy training programs that are taken voluntarily and

delivered through volunteer trainers at the local level.²⁸ Based on ITEPA interviews, the NFED appears keen on the use of ICTs for advancing functional literacy among Ghana's adult illiterates and out-of-school youth, but little activity has taken place to date using ICTs. Since the mid '90s, they have sustained radio-based instructional programs that augment their in-person literacy training efforts. However, GoG NFED has yet to begin work on developing computer and Internet based resources and pedagogical strategies. Considerable enthusiasm was expressed for embracing opportunities for computer-based training during the course of ITEPA's investigation, especially in terms of materials that would enable the division to deliver higher quality train-the-trainer schemes that will also ensure consistency across a national program in basic literacy education.

In the late 1990s, through grants received from such organizations as the DFID and the World Bank, NFED developed a set of printed primers in each of Ghana's main languages as well as English, and they have been put to use in the field for over five years. According to the DFID sponsored report cited above, the NFED program had two major consequences: "(a) it helped strengthen NFED's program delivery system during the initial rapid expansion, and; (b) it developed a model closely similar to that of the national literacy program." The NFED has just completed an update of these primers and has expressed interest in the possibility of rendering these teaching materials into computer-based media and developing a computer-based pedagogy for its use.

Though enthusiasm levels are high, due to the scarcity of resources, progress on the use of ICTs in NFE has been slow to non-existent. Computer and Internet resources in NFED are very limited, with only some field offices wired for administrative use, although each field office is reported to have at least one computer. Field offices exist at each of the ten Regional levels as well as at the smaller District levels within each Region. Record keeping continues to be done manually for the most part, and computer usage on a daily basis by NFED staff in both main and field offices is not commonplace. There is no Web presence for NFED, and no e-mail domain or coordinated resources exists for enabling electronic communications.

3.2.3.2. *Non-Governmental Sector*

Some of the most significant efforts to date to use ICT for non-formal education and community development (NFE-CD) are being carried out by various non-governmental organizations (NGO) in Ghana. NGOs with a wide variety of missions to serve the poor through community development programs have embraced ICT for NFE-CD as an integral part of their strategies. For instance, several faith-based NGOs from the USA have for some time engaged in the use of ICT in the course of their work. In the Northern Region, one organization that has been engaged in Bible translation activities has also been providing functional literacy classes to adults and out-of-school youth. Their work in translation and linguistics has relied on the use of computers for both research documentation purposes as well as communications. However, they have yet to enter into the use of ICT for literacy training, and no research appears to have been done on their

²⁸ http://www.dfid.gov.uk/policieandpriorities/files/africa/ev_s586.htm. This is a 1992 DFID sponsored report related to the follow up funding from the World Bank. The World Bank has apparently undertaken a report on NFED which has not been released to the public, and which the present authors have not been able to review.

work. Another American faith-based NGO in the Northern Region had set up a MPCT several years ago, and has offered computer training classes to community members. This telecenter does not have Internet connectivity, and is used solely for basic computer usage training purposes. This NGO also has a well-developed basic functional literacy program, but they have yet to consider implementing the use of ICT in basic literacy training. Again, no evaluation documentation is available.

3.2.3.3. Tertiary Education Institutions

At least three of Ghana's six public universities have become actively and directly engaged in ICT for NFE-CD efforts. These include The Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi, the University for Development Studies (UDS) headquartered in Tamale, and the University of Winneba (UW) in Cape Coast. KNUST, in collaboration with the University of Pennsylvania (PENN) in Philadelphia USA, has embarked on perhaps the most ambitious effort to date to extend ICT to needy communities in Ghana.

Through a sizeable grant (over US\$1 million) from Hewlett Packard (HP), working closely with PENN and a newly founded NGO, Community Services Foundation (CSF), KNUST has been able to install a campus wide ICT infrastructure, as well as engage in an ambitious program of installing MPCTs throughout Ghana's Eastern, Northern, and Ashanti Regions. Since the summer of 2002, the "Ghana Digital Villages Project" (GDVP) has installed nine MPCTs to date. The GDVP model incorporates human and material resources of the universities that are involved (PENN and KNUST), the coordinating NGO (CSF), and sponsoring corporate philanthropies (led by HP). Further, UDS joined the GDVP by receiving two MPCTs at two of their branch campuses as well as computers for the central administration building in Tamale. The GDVP is clearly one of the more prominent corporate projects to utilize ICT for the poor. Even so, there has been little in the way of evaluation, and it is unclear how much more HP will invest in the GDVP or whether this type of investment will be extended to other countries in Africa.

University of Winneba (UW) is Ghana's main tertiary institution for teacher training for K-12 formal education.²⁹ As part of UW's educational programs, distance-learning courses for teacher development have been offered for quite some time. These courses are exclusively based on text/print media, but they are planning to move their materials to computer and Internet based operations. Major funding agencies have made commitments to UW for this effort, including the Carnegie Corporation in the USA, as well as USAID and DFID. UW seeks to establish MPCTs and/or collaborate with others for possible dual/multipurpose use in implementing computer based distance learning programs for teacher training and development. Clearly there is a need for donor agencies to co-ordinate their efforts in such funding and capacity building in order obtain the most effective consequences.

3.2.3.4. Corporate Philanthropy and Donor Agencies

²⁹ http://www.ghanauniversities.com/university_college_of_education.htm. Consult this site for more information on University College of Education.

In addition to the HP-sponsored GDVP mentioned above, a number of other American and European ICT companies, as well as several Ghanaian ICT service providers have made significant contributions. BusyInternet in Accra, arguably the largest and most prolific commercial cyber café in all of Ghana, provides free or subsidized computer usage training to youth. In terms of donor agency involvement in ICT for NFE-CD, while most of the support is channeled into formal education, there are examples of MPCT related projects conducted by NGOs that have received support from such agencies as USAID for purchases of equipment and services. Imfundo (DFID) has also recently increased its support of ICT for teacher training in Ghana.

3.2.4. Findings from field interviews in Ghana

The findings below are derived from field interviews that were conducted in Ghana with key informants who were either operating MPTCs or actively involved in policy and program decision-making, the details of which are provided in Annex 1B in summary form. In addition, they draw from observations as well as direct experiences of MPTC operations in Ghana.

There is currently only a handful of MPTCs that are installed outside of formal educational settings, numbering no more than around 10-15 at most throughout the country, and mostly located outside of major metropolitan areas of Accra and Kumasi. In almost every instance, MPTCs were initiated by a single visionary who marshaled resources together to make the community access lab a reality. Usually, these individuals were directly involved, making personal material investments as well as devoting significant amounts of time to the enterprise. The future success as well as sustainability of these facilities seemed to depend greatly on whether this individual maintained his or her involvement. In many instances, MPTCs became no longer viable when the individual discontinued his or her involvement. Several respondents mentioned that their MPTC has been dormant because the founder could no longer maintain his or her involvement in the MPTC. One respondent actually stated that with much regret, her personal resources had run out, and that she had to abandon the MPTC operation she had started in order to join a US based NGO that wanted her services.

In many instances, as reported by survey respondents as well as through first hand visual observation, MPTCs were established with very little resources, and without a broader context and framework in which to operate. With one notable exception, many were single, stand-alone efforts that had no participation in a broader community of MPTCs. The nine MPTCs that were installed by one Ghanaian NGO represents an effort to create a community of MPTCs that attempts to share a common core of resources such as training opportunities, hardware/software maintenance and upgrades, as well as revenue sharing in order to maintain a financially self sustaining operation. Says the Director of this NGO, "... the income level [of this village] is so low that we are not expecting even cost recovery. There is no money to sustain the project. We are able to break even because of earnings from other locations."

As reflected in the respondents' remarks, currently operating MPTCs are working without a model of financial sustainability, and will likely be unable to make any significant progress toward growth, expansion, or infrastructural improvements such as gaining Internet access. Where projects received material support from corporate philanthropy or donor agency funding,

the levels of support usually represented a one-time effort, with no continued or sustained support beyond the short term.

There is a general lack of capacity in developing and using content and training effectively. Most MPTCs serve as locations for users to learn about basic computer usage, such as “keyboarding,” mouse control, file manipulation, and simple productivity applications such as word processing and graphics. Almost none of the MPTCs were Internet enabled, so users were not provided with opportunities to learn about and use e-mail communications and the Internet. All MPTCs relied solely on using productivity applications produced by Microsoft. In some cases, the labs also contained a fairly large menu of US based free educational software that are geared toward primary and secondary school students and that have become an important part of the utilization of the labs.

Several of the organizations that were interviewed focus their activity in the area of provision of content and activities via the Internet. These organizations’ programs are geared toward the formal education sector, and work closely with the installed base of ICT that already exists in the public and private schools. Unlike the situation with MPTCs, a respondent from one such organization stated that funding was quite adequate for their initiative. In another case, their program was initially seeded by a very large multi-year grant from a multilateral donor agency. Since they work within the formal education sector, they are hopeful that the Ghanaian government’s National Education Service is preparing to fund a national initiative to advance the learning and use of ICTs among students and staff at high schools throughout Ghana.

In the area of monitoring of MPTCs’ performance, most if not all centers do not possess real capabilities to document accurately and routinely data such as usage rates and skill levels that have been attained by users. With a few exceptions, most operations were unable to produce even a log of names of users. This is a key limitation in understanding effectiveness of ICT applications for the poor. The occasional ‘good anecdote’ is therefore sometimes used as a generalized finding to describe the impact that the MPTC is making in the community and on individuals.

Finally, the question of the scalability of various efforts received mixed reactions from interview respondents. Much depends on whether there is the presence of available material and financial support as well as human resources. There was a clear absence of any discussion regarding sustainable financial/business models among those interviewed, perhaps due to the fact that most if not all of these MPTCs serve poor communities that cannot generally afford to pay much if anything for lessons or usage of the lab, especially since most if not all of the labs lacked Internet connectivity. Those interviewed who were associated with content- or training-driven enterprises were better poised for scaling and expanding their work, but here again, the main obstacles to scaling up their programs surrounded the lack of financial resources. Infrastructural constraints (i.e. availability of telephone lines) were also mentioned as serious impediments to scalability of the various efforts.

3.3. Surveys From Other Countries in Africa

The key generalizations below were derived from five surveys from a number of other African countries, the details of which are provided in Annex 1C. Many of the observations reinforce trends observed above in both South Africa and Ghana.

As noted earlier, many projects in Africa do not include a monitoring and evaluation component. Data are often based on quantitative and not qualitative indices yet the latter often better indicate the issues that need to be understood in Africa. Also, data may be biased and distorted for political or economical motives. Therefore data validity should be considered with care. Empirical baseline surveys should be carried out initially. Some ICT initiatives are initially seen as threatening by teachers where the skills base is very low. Such perceptions need sensitive management. Naturally, the quality of content and learning materials should drive technology decisions, and not vice versa. The importance of local languages should not be under-estimated.

International organizations and donors should work at the policy level to influence the national decision makers, loosening their grip and opening the doors for the poorly appreciated impact of ICTs to expand into the poorest communities. Yet, ICT strategies in Africa are constrained by lack of awareness of the cross-cutting impact of ICTs among many policy and decision makers. Complex issues such as the privatization of telecommunication sectors and IPR are poorly understood. Too little attention is being paid to strategic plans for reaching the poorest communities via: rural ICT Infrastructure; reliable telephone networks and telephone lines; and cheap Internet access. Implementation of ICTs has often been erratic, ill conceived, poorly conceptualized and more often than not, inappropriate for achieving the proposed objectives.

If initiatives find a balance between both community and individual benefit, then it is a recipe for success, since such a win-win approach could (but rarely does) produce sustainable projects and contributes to holistic development. When representatives of different community groups are involved, there is a multiplier effect and the whole community identifies with the project. This leads to broad ownership, which is pivotal for success and sustainability. A common problem is that Telecentres are ostensibly set up for disadvantaged communities otherwise unable to afford access to ICTs. Yet they are often placed too early under the whip of 'self sustainability' which conflicts with reaching the poorest of the poor. Planning and management of long term sustainability strategies is often neglected.

Many ICT projects (both public and private) have had negative outcomes, generally due to poor conceptualization, consultation with communities and stakeholders. Incorrect design and implementation can waste scarce resources which could otherwise be used to alleviate serious problems of the community, as well as cloud the thinking of decision makers and communities regarding the potential benefits of ICTs. Few African governments provide the necessary financial support or support infrastructures for survival of ICT projects, as they are invariably preoccupied with more pressing economic and social issues. Finally, issues of content (which are usually critical) are often downplayed and allocated inadequate resources.

Paradigm shifts into creative ways of project formulation are mostly driven by individuals close to or from within the poor communities themselves, rather than the established major development agencies. Hence, they are seldom supported by such agencies since they are outside the normal and acceptable project models.

Relative to Latin America and South Asia, Africa's uptake of ICTs has been slow. ICT projects in Africa are largely based on experience gained in developed world environments, which may prevent "re-inventing wheels," but at the same time assumes similarity of circumstances. As mentioned earlier, there is need to apply solutions to Africa's practical problems which are superior to "imported" solutions by addressing directly the problems of relevant local content, in local languages. In this sense, the data from 'other' African countries mirrors very well what ITEPA has found in South Africa and Ghana.

4. THEMATIC FINDINGS ON MOTIVATION, INEQUITIES, AND PRO-POOR POLICY: DISCUSSION OF DATA GATHERED

This section summarizes three broad themes that emerged from field observations, interviews and surveys. A number of general and specific policy recommendations and conclusions will be provided in the section following this one.

4.1. Motivation for ICTs among the poor

Overall, respondents showed interest, and often great enthusiasm, in increased access and involvement in the use of ICTs for development. This is not surprising, though, in fieldwork focused on those involved in some way in ICT in their own countries. Further, our observations and interviews indicated that it was not only the service providers and GO and NGO agencies that were positive, but also the beneficiaries (children, students, unemployed youth). In other words, many actors, agencies, and end-users of all types are much more aware of the *potential* of ICTs for *them and their lives* than was apparently true only five or so years ago. Even in the late 1990s (not to mention earlier on), there was a palpable feeling that ICT was a ‘show’ project only, with the caricature of a minister giving a PC to a school for a photo-opportunity. While this *first* comment/image is still occasionally mentioned (and it was made to these researchers), it was nearly always followed by a *second* comment about what *should* be done with ICTs for poor people. This is a dramatic change in feeling and motivation among the disparate parties concerned; but, as noted below, this *second* comment was equally often followed a *third* comment that what is now being accomplished is still far from adequate in both quantity and quality (including equity) of what needs to be done.

4.2. Inequities in ICT Access and Connectivity

There is widespread agreement among respondents that Africa’s hardware, electricity and telephone infrastructure are inadequate to support the current and growing needs of ICT initiatives and possibilities, especially in rural areas. The problem is less extreme in South Africa than in Ghana, but rural areas still have a long way to go in both countries. Likewise, a number of respondents felt very strongly that national policy directions in the ICT domain are not sufficiently forward-looking and aggressive enough to enable public resources to be released to improve the infrastructure needed. In addition, some expressed frustration that policy measures are slow to be implemented, and there are some on-going debates as to the separate roles that the public and private sectors ought to play. For example, when and how should an e-rate scheme be implemented for education and for those engaged in NFE, literacy and community development work? There is a strong feeling as well that the reality of ICT inputs and resources favor some groups over others, and that the ‘photo opportunities’ and public relations sometimes mask the true situation which is that too little is trickling down to the poor. Also, respondents noted significant inequities in access, content and usability with ICTs across national boundaries, rural and urban regions, ethnicities and gender. In the countryside and in villages throughout Ghana, for example, the challenges involve both the lack of infrastructure, including electricity and telephony, as well as the lack of technical capabilities in ICT to support and sustain an ICT facility even if the infrastructure exists. In South Africa, young people (and women especially) in

poor communities are often given less access to ICTs than male teachers, male youth, and community leaders (usually older men). These situations are changing, it seems, but is it unclear from the ITEPA study how new approaches will be able to overcome both insufficiency and inequities rooted in traditional, often patriarchal, society in the near future.

4.3. Pro-Poor Policy in Support of ICTs and Development

With various whitepapers and other lead policy documents produced, the case for policy development in South Africa is considerably more advanced than that in Ghana (and probably in the rest of Africa). Nonetheless, there is also frustration that so much needs to be done for poor people, even in a country like South Africa, where the affluent already possess robust ICT resources. Even so, beyond some installations in schools (mainly secondary schools) and in private cybercafés located largely in urban centers, there remains little or no public (non-fee) provision of substantial ICT access for the out-of-school poor, in either of the two focus countries or across sub-Saharan Africa. Clearly, for improvements to take place, governmental and private leadership needs to be increased, not just in rhetoric but also in infrastructure ‘on the ground.’

The challenge remains on finding effective ways to keep the focus on the EFA and MDG goals of helping the poorest sectors. As we enter the second generation of individuals who are using ICTs in and out of schools in Africa, there seems to be a growing concern among the respondents that the relatively more affluent groups (urban, middle class, private schools, secondary/tertiary education) are more favored than the poorer groups. Given the local and national politics of all countries – and here Africa does not seem to be the exception – it seems that pro-poor development policy is often put at risk by those who feel the need to install quickly and depart, and for this to happen it is ‘practical’ to meet the needs of those who are ‘easiest to reach’ – the natural opposite of a pro-poor ICT and development policy.

5. LOOKING BACK, LOOKING AHEAD: CONCLUSIONS AND RECOMMENDATIONS

The final section of the report provides some broad conclusions from the ITEPA project, which comprised a focused yet small-scale effort to ascertain and assess the last half-decade of ICT4D among the poor in various parts of Africa. The report ends with a list of 26 substantive recommendations based the present findings which will chart, hopefully, some new directions and next steps for work in this crucial area of development.

5.1. Moving towards Pro-Poor ICT-based Development

This study reinforces the view that many (if not most) ICT-based projects in Africa have yet to achieve the positive impact on development that was originally anticipated, and in most cases have failed to create an information society that will ‘leap frog’ (as some say) the continent into the next stage of development. The unfortunate reality is that national governments and the international development and donor organizations which have been primarily involved in the establishment and funding of these projects have usually done so in an uncoordinated, incoherent, ad hoc fashion, resulting often in wasteful duplication, little quality monitoring, and outcomes that rarely reach the bottom half of the populations in Africa other than in ‘demonstration’ projects. It is also important to say, at the outset, that the ICT domain is one that shifts rapidly, and the costs in human and fiscal resources, as well as natural obstacles of insufficient infrastructure, can hamper even the best thought out and well-funded programs.

The early pro-poor ICT focus in Africa was on providing access to computers for community use, as well as access to the Internet (albeit with very low bandwidth); this is now generally recognized as having been too simplistic, as other needs have to be considered in a parallel fashion, including to:

- promote a widespread ICT infrastructure and connectivity;
- create local human resources and skills among both end-users, and those who provide maintenance, training, and innovation;
- provide content that is relevant to local, community needs, and that is linguistically and culturally sensitive;
- identify and support local champions and early adopters wishing to establish valuable pro-poor services.

There is a need, we believe, for a significant leap of vision and political will from the ‘early’ initiatives – many of which seem to be uncoordinated and often times repetitive – that have been seen over the last decade or half-decade in ICT for development. Some points of light, such as the recent gatherings in Africa (e.g., tied to NEPAD), as well as the World Summit on Information Societies, give reason for some optimism. ICT resources are, it appears, becoming more available worldwide, with experiments and innovation expanding, and national governments beginning to commit themselves to the *promise* of making ICT available to the poor. As of early 2004, these promises have yet to be realized in a significant way for poor people.

5.2. The changing concept of literacy

The concept of ‘broader literacy’ needs to be seen as an important paradigm shift at global, regional, national, institutional, and individual levels. Current education systems in the developing world cannot be scaled-up to reach all the potential learners, particularly the most disadvantaged who mostly populate the remote and rural areas, and make up the ‘unheard and invisible’ majority of that population. Hence, to achieve ‘Education for All’ requires great expansion to those in need, which in turn requires, we believe, the adoption of new learning/teaching paradigms, at least some of which will need to be ICT-based. Such expansion will necessarily require the appropriate use of ICTs, and must go beyond the traditional ‘efficiency and effectiveness’ approach to specific ICT tools and ICT access. Moving ICT-based learning into the broader realm of understanding how to interact with digital information, both producing and receiving, will be (and already is in many parts of the world) a key component to the education for a new and more developed Africa.

5.3. African Content is Central to African ICT4D

Both practitioners and experts concurred broadly that there is a need to develop useful ICT applications to be successful in meeting the needs of *linguistically and economically diverse end-users*. Suggestions and ideas included:

- local language content for life skills;
- indigenous content for vocational skills;
- content for health and disease prevention;
- computer and adult basic literacy content for both international (English) and local African languages;
- specialized applications and hardware for people with special needs.³⁰

Teams of multi-disciplinary experts could and should be formed for the creation of a range of interactive, multimedia based learning materials. These persons would include: subject specialists, pedagogues, instructional designers, digital and multimedia specialists, software and hardware engineers, language and culture specialists, learner support specialists, and representatives of the learners themselves. These teams should both stay abreast of and contribute to relevant global research, as well as ensuring that learning material is sensitive to local issues (e.g., language and culture). A network of centers (in universities, institutes, and other sites) should be developed throughout Africa, as an integrating driving force of the development of pro-poor learning (‘broader literacy’) materials. This type of alliance of common interests with diverse skills is likely to be a requirement for effective implementation.

5.4. Informational Needs for Project Success

Beneficiaries (the ‘end-users’ of ICT-based efforts), especially from the poorest communities, have little if any experience of ICTs, nor might they fully appreciate their potential benefits. Hence, they are highly dependent on the external project designers, implementers, and top-down policy makers. While a pro-poor effort would normally try immediately to put the beneficiaries

³⁰ See recent Imfundo report on this topic at www.imfundo.org.

in the proverbial “driver’s seat”, this approach may be unwise where ICTs and other technologies are involved. Thus, a major responsibility remains on the shoulders of these external agents, who will need to ensure that they clearly understand the problems and circumstances of the community in question. Among the key issues that we have found to be crucial to the success of ICT-based development are the following (most of which are in no way original, but nonetheless must be continuously kept in mind):

- Conducting a needs analysis, fully involving communities in general, and target groups in particular, depending on the project.
- Creating preliminary awareness of the potential benefits (and inappropriate expectations) of ICTs within the target community/groups.
- Driving carrier technology decisions by quality of content and learning materials, and not vice versa, with the importance of local languages being emphasized.
- Building a relationship with and consulting the target beneficiaries.
- Identifying local champions and implementers, and providing them with the appropriate skills (ICT and many other), as well as support resources (real and virtual).
- Developing clear, realistic, but flexible project design(s), co-owned by all stakeholders.
- Using participative processes to prioritize, select and present potential solutions to ensure community ownership and understanding.
- Including monitoring and evaluation and responding promptly with necessary changes in response to problems/issues exposed, despite the significant time overheads.
- Using ‘trial-and-error’ techniques, with a willingness to listen, learn and change and to adopt more of an ‘incubator’ approach – setting up several prototype models.
- Collecting data at a systemic level of a much higher quality are minimally needed, and with a focus on the central educational problem, not on ICTs alone.
- Avoiding unrealistic goals and objectives imposed by donors.
- Assessing the broader impact (both direct and indirect) of each project on not only the individuals using the services provided, but also on the wider community.

5.5. Capacity building in Africa

There is a broad consensus on the need to create the human resources in Africa so that local ICT products and services (for Africa by Africans) can be put into service. More specifically, there is a need to:

- create demand for certain indigenous services through policy, through capacity-building, and through evolving relevant applications;
- tap into the indigenous knowledge that exists within Africa to meet African challenges;
- re-evaluate the government regulations that hinder pro-poor policies and local people, especially among the poor, from initiating indigenous ICTs;
- introduce local language ICT applications as a step towards creating an indigenous ICT sector;
- support local ICT infrastructure through, refurbishing computers, use of OSS, and increased
- connectivity options that are reliable and affordable for rural and remote areas; and
- develop community ownership of information, through the appropriate balance between

intellectual property rights (IPR) and ‘global goods.’

5.6. The Role of Research

It is nearly axiomatic for researchers to end reviews such as this one with a call for more research. Yet, in this domain of ICT for development (ICT4D), with a pro-poor focus, the call should be not only highlighted, but probably required. There are numerous reasons why research should be part of any innovative enterprise, and these need not be enumerated again here. However, in the pro-poor domain of ICT4D there will always be fiscal and political pressures to reduce costs and provide user-fee driven (private sector) methods for sustainability – and, each of these factors work, at least in the near-medium term, *against* a pro-poor policy. As Bill Gates famously said in a 2001 speech in Seattle, poor people with only \$1/day of income are unlikely to spend even a fraction of that dollar on ICT. Thus, to establish credible models for productive and sustainable use of ICTs for pro-poor development it will be essential to show the various returns on investment (ROI), whether education, social, economic or otherwise. African national budgets are too stretched to afford non-credible outlays, and when these happen without solid evidence, programs will nearly automatically be terminated. Hence, the national and international policy making communities need to be convinced of each and every investment in ICT4D, and especially how these investments reach the very poor.

5.7. Need for Coordination

The ITEPA findings strongly support the growing belief that there is a lack of coordination between various entities and organizations (GO and NGO) and donors that hampers the ability for ICT4D to make significant advances, and generally gets in the way of a pro-poor policy framework. In one case, an NGO mentioned that they discovered, after the fact, that a basic literacy project in Ghana on which they were working was being duplicated in almost exactly the same manner as theirs, only in another region of Ghana. Both organizations ended up having to undertake the same learning curve separately, whereas obvious savings might have occurred if communication had been maintained; further, both initiatives have failed to gain ongoing support and both continue to languish. While nearly all respondents called for better co-ordination, these were sometimes also tempered by a concern about ‘too much control’ from the outside. In any area like ICT4D, there needs to be a useful and productive balance between coordination and creativity, one that remains elusive in the African context.

5.8. Recommendations for the future

Above we have provided some broad conclusions concerning a pro-poor approach to ICT4D in Africa. What follows is our alphabet (a-z) list of recommendations (broad and specific) that follow from this study. The list begins with broad issues related to literacy, education, development and co-ordination, and proceeds to specific ICT programmatic suggestions.

- a. Pro-poor approaches to ICT4D are neither quick, nor simple, nor cheap – but they are critical to achieving the major goals of EFA and MDG.

- b. A better understanding of the concept of ‘broader literacy’ is needed, that goes beyond the traditionally limited concept of functional reading and writing.
- c. In many pro-poor projects, local content needs to be given a much more central role; access is only one part of the process of ICT4D, but the last ‘3 cranium inches’ is where the learning dimension takes place.
- d. Integration of ICT and education issues across various government departments (national and provincial) is needed in most African countries.
- e. Much more attention needs to be paid to strategic plans for reaching the poorest communities via the most appropriate of a wide range of available ICTs.
- f. Vision is a pre-requisite for all projects to succeed, with each individual project *working up* to the larger whole, although providing value in itself. Specific projects must link to the broader vision, which, like an elastic band, must be able to serve at various levels without undergoing drastic changes, responding to needs as they arise.
- g. A more balanced approach is needed by international organizations and donors working at the policy level to influence the national decision makers, loosening restrictions and opening the doors for ICTs to expand into the poorest communities.
- h. Collaboration at the national and regional levels can add enormous value when harnessed successfully, especially when it spans public and private sectors, donor and poor communities, and so forth.
- i. A climate is needed in which innovations, appropriate pilot projects, and other micro-level interventions can flourish and add value locally, nationally and globally.
- j. Policy focus needs to shift beyond trying to implement (i.e. scaling up and force-feeding ‘successful’ small-scale pilots) towards *creating an enabling environment*.
- k. All projects need the early development of a shared vision between those funding the project, those running it, and those intended to benefit from it.
- l. At the highest level, much ICT rollout on a large scale is pointless until fundamental national infrastructure is provided, e.g. water, roads, and electricity. This requires high-level political commitment, without which vision at lower levels is irrelevant.
- m. Awareness of the cross-cutting impact of ICTs needs to be created among many policy makers.
- n. Bottom-up demonstration activities and holistic information society policies are needed in parallel. As the processes evolve, the two should converge, with the demonstration activities providing lessons for the policy to address and the policy process scaling up the successful demonstration projects.
- o. ICT projects require a sophisticated balance between creating awareness of new possibilities generated by ICTs and taking into account the context and needs of the intended beneficiary communities. The external agents need first to create awareness and understanding in local communities of the potential benefits of ICTs – a benign ‘push’ process where it is necessary.
- p. Further research is needed on how ICT can support existing local information and communications flows generally, and on local initiatives in particular that build on social entrepreneurs’ ability to respond to local needs.
- q. Experts need to focus less on ‘delivering’ quick superficial implementation and more on developing *credible* capacity and a defensible knowledge base concerning outcomes.

- r. Participatory rural appraisal approaches to project design, which suggests a growing interest in community involvement could be useful, but there needs to be a critical mass of local champions who can become responsible for balancing diverse community and individual needs.
- s. Project planning frameworks are needed where money is only spent when the project participants are ready, rather than spending it prematurely because of the artificial time frames of governments and/or donors.
- t. There are major systemic requirements beyond the basics of electricity, water, roads, and telephony.
- u. The long-term issue of holistic telecommunications reform must be given higher priority.
- v. Commitment is needed to ICTs for development across a wide range of sectors, within and beyond government.
- w. Some type of “Community ICT Service Brokerage” would be helpful to provide training, links to computer refurbishment and OSS organizations, business ideas and templates, links to useful info, and assistance with local content creation.
- x. Small scale testing is an important and cost-effective strategy for innovation in ICT4D, but the temptation to ‘scale up’ prematurely and/or inappropriately must be avoided.
- y. As key supporting agencies, donors also need pilot phases to gain experience and identify what works and what does not work so that they can maintain funding over the long haul.
- z. Major initiatives need a clearly defined *development* phase, so that project continuation does not depend on short-term ‘success’ or ‘failure’ at project onset.

5.9. Final thoughts

The people who best understand the development needs of poor communities in Africa are those who are from those communities. Yet the most powerful actors in the ICT4D realm remain the international donors, national governments, some large (mainly international) NGOs and the private sector. The gap between these two groups is often very large. Further, in spite of a few large public relations splashes, there is still not much investment available for ICT4D, and it remains only a tiny fraction of all development aid. There is, nevertheless, reason to believe that this fraction will grow, if only because traditional solutions to education and economic development have proven to be limited, while ICT-driven projects seem to be bringing some important examples of success, even if on a relatively small scale to date.

If we examine the wide range of needs of the broad spectrum of people in Africa, it becomes clear that many of the current ICT4D efforts, even if deemed to have been successful, have not encompassed a sufficiently pro-poor perspective. This is most obvious when one considers that imported content (in English in South Africa and in Ghana) is of little use to the many millions of excluded people for reasons of literacy, language or culture. Clearly, local language content is one area where pro-poor approaches can make significant strides, even as a bridge to multinational languages such as English. Further, user-friendly multimedia tools can satisfy the needs of the poor to a much greater extent than heretofore produced. Providing such tools and

developing the human resources capacity to support the local development and distribution of relevant content is likely to initiate a positive spiral of sustainable development. Much can and needs to be done to invent a pro-poor approach to ICT and development, and one that will benefit the African economy, society, and *all* its citizens.

ANNEXES

Annex 1. Tables (A, B, C): Summary of Surveys from South Africa, Ghana and Other African countries

Annex 2. South Africa: Survey compilation of key findings

Annex 3. Survey Results of Three Specialists

Annex 4. Findings from Other African Countries - Electronic Survey Findings

Annex 5. Full ITEPA Survey Questionnaire (face-to-face)

Annex 6. Short (e-mailable) ITEPA Survey Questionnaire

Annex 7: Workshop Report, ITEPA-Ghana (Feb 2003)

Annex 1. Tables (A, B, C): Summary of Surveys from South Africa, Ghana and Other African countries

Table A. SOUTH AFRICAN SURVEYS						
Project Details	Rationale	Project Plan and Implementation	Champions and HR skills	Funds	Monitoring and Best Practices	Sustainability and Scalability
SA1. University – linked ICT Centre 40kms from the University	Establish a community outreach satellite center to teach science and maths via ICTs to literate and illiterate community members.	Design in line with the university planning format focusing on targets and deliverables. The project is presently servicing only 6 of the 28 schools in Vuwani	Currently 2 full-time staff, well qualified and paid by Univenda. Manager reports to a 13 member steering committee representing the University, the community and the government.	Zenex gave 22 PCs; Univenda built center on Vuwani land, and raised funds from the SETA for HR and running costs.	Little monitoring other than student records. However, center cannot satisfy community demand, which is growing. Good example of how universities can work with communities: Brand; Skills; Share resources; Avoid mistakes. Initiative is 'learning by doing', and 'growing by linking'.	Sustainability not well understood, e.g. rent, salaries subsidized by Univenda which is subsidized by state Thought to be scalable – DST wants to expand center, and model of University as 'anchor' to be grown with 5 more satellites.
SA2. MPCC , Soweto	Ensure that neediest in the community have access to ICTs; to eliminate the 'divide' between town and township; and to foster information culture at grassroots level.	Plan was drafted by working team including the community and ICT experts. Provides Information and ICT Literacy courses, plus maths and science tutoring. Started providing ICT literacy for non-English speakers.	Centre manager and secretary are qualified, with 3 rd year students providing services linked to their studies (e.g. law, ICT support, HIV, etc.)	Community raised R100,000 for structure; Church subsidized and provided land, multiple donors of PCs, printers, furniture, etc.	Substantial data collection and monitoring of training and impact on beneficiaries. Student profiles recorded and progress of students outside center also monitored. The center is run for the community, by the community, in touch with community ICT needs. The manager's championship has been essential.	Currently covering running costs, but management team seeking longer-term sustainability models. Perhaps a cyber-café, but cash may increase crime (broken into twice). The hope is that every church could take this model and spread it across Soweto and the country.

SA3. Community Telecentre KwaZulu Natal	Part of the Universal Services Agency telecentre projects for rural KwaZulu Natal.	Followed the USA project plan. Used a community built hall. Selected a Champion, who won approval of local chiefs. Now defunct since Champion died.	Initial 2 well skilled members of staff left when Champion died. No-one now qualified. Depend on volunteers who leave as soon as they gain skills.	Ten PCs, Fax and photo-copier donated. Hall donated by community Future funding not clear.	No monitoring, especially since the Champion died. Case shows value of Champion, but danger of dependence on one person. Unclear ownership is major problem. Difficult for community to look 'outside' for support.	Sustainability not established, although "50 people turned away every day" – so demand is there. USA did not set up for sustainability, and has not offered to help in current crisis.
SA4. Internet Hub Site, Kathlehong township	One of 4 provincial projects: Gauteng, Limpopo, Eastern Cape and Western Cape. To connect schooling community in poor areas with ICT.	Plan set up by development NGO. Target was 15 Kathlehong high schools, each housing about 1000 students. Community re-formulated when NGO left.	Original 4 staff well qualified, but left when NGO left. Community found volunteers manager and trainer – partially qualified, but dedicated.	NGO funded 22 PCs and provided training and employed 4 staff. Now new funding model needed.	Monitors trainee numbers, types of training and schools involved. Also tracks resultant individual employment and progress. Provision of a wide range of services important, also forced community ownership has been beneficial.	Initial NGO plan did not provide sustainability. Community 'take-over' and new services shows ownership/relevance/need. But, volunteers need reward for sustainability. Scalability by many more centers, not one bigger center.
SA5. Telecentre. Near Pongola – Isolated rural site.	To improve quality of lives in community, find more and better employment, broaden skills base, and close rural-urban gap.	Ndumo Community Committee built community hall in 1997, and added PCs from USA in 1998. First plan failed (closed 2 years), open again, and plan being reviewed with new partners.	Staff (manager, administrator and 2 technicians) qualified, but were unemployed. Were committed volunteers from community, but now paid small incomes due to recent success.	First funds from Dutch government and KPN. Later USA gave PCs and furniture. Now Peace Foundation giving good support.	Monitor each student during training, and career progress after – but not yet digital. Past 3 years, ALL students (~60) have found employment. Poor support from USA disappointing. But, new relationships good, including University, and local SMMEs. Provision of multiple services essential.	New, community driven, multi service model seems successful (covering costs). Coping only with 20% of demand – need more PCs and Internet access. More services being set-up. Could form hub of many satellite centers in region.
SA6. Mpukunyoni Telecentre	Founded by local woman champion who believed the center providing ICT skills would enable rural	Initial USA plan failed. Founder then adapted plan and took ownership. Targets 5 areas in	4 trainers visit schools 1 trainer in center, plus manager (founder). All are volunteers, and	After 3 years, USA installed 5 PCs, fax, photocopier furniture in community hall.	Monitor progress of all center students, but manually - no digital records/database	Post USA model provides funding for services, but not for staff costs. However, community

	youth to break out of the cycle of poverty.	Zululand, 13 schools and 7 unemployed youth groups: total 400 people impacted a year.	ICT skills are self taught (no formal qualifications). High staff turnover	No other USA support – funds raised from services.	to date. The variety of services raises some funds, and generates community interest (including new volunteers). Support of volunteers essential. Very poor perception of USA plans and processes.	demand growing – more PCs would generate more income, and could become hub for many remote satellite schools.
SA7. Educational Resource Centre KwaZulu Natal	Promote quality ICT education in rural areas to stimulate the local economy, tourism and employment opportunities.	Part of the presidential imperative projects. Plan mainly from the Shoma National Plan. Target population: 4 districts in KwaZulu Natal. 3 teachers per school per year.	All facilitators are volunteers and teachers. Centre Coordinator also qualified teacher Centre support includes 2 cleaners, gardner, and security guard.	Funding via Dept. of Education, and co-funded by: Belgium Development corp, Zenex Foundation BHP Billion, Transnet, Royal Netherlands Embassy.	Records of each student and all training kept manually. Funding inadequate as focused on elaborate building still under-utilized. Volunteers highly committed but receive no reward/recognition. Only educators allowed to use facility – defunct MPCC next door – community demand for ICT high, but no access.	The current model is not sustainable. The DoE covers running costs, but pays no salaries. Volunteer commitment is waning. If services widened, and provided to whole community, could become hub for many satellite facilities.
SA8. Educational Resource Centre –Hlulhuwe, KwaZulu Natal.	To bridge gap between rural and urban students via ICTs. Became SHOMA centre for OBE through technology.	Followed generic SHOMA plan and process. Reaches 3 teachers per school per half year.	Center run by one librarian, overseen by committee of principals. Head of center is a Principal from another school, so daily running done by librarian.	Funds from MEDI trust and Sacred Heart College. Funding covered equipment but not security or running costs.	Records of each teacher are kept manually, but no monitoring is done. Intention good, but many problems: insufficient funds, support, training or security.	Government grant seldom covers monthly running costs: salaries, machine maintenance, and cartridge expenses. With a better model, could become hub for many satellites.
SA9. Community Computer Camp, Mogalakwena	Increase ICT Literacy amongst pupils and out of school youths, using language sensitive material.	Camps held in July at 11 sites in 3 languages targeting learners, employed and unemployed. Learners receive certificates and gifts.	A group of 15 trainers covering the 11 sites Project managed by professionals from HP Provincial and Municipal support, e.g. security	Adequately funded jointly by 3 partners-HP, province and municipality.	Full records of all trainees, plus their evaluation of the program. In total 856 people were trained to date. Training goes out to remote communities, but	Sustainability has yet to be evaluated. If successful, similar courses could be provided on a much larger scale around the country.

					not a permanent facility. Impact on communities unclear.	
SA10. Icomtek Eastern Cape.	Implement innovative ICT's for sustainable development of deep rural areas, including ICT literacy for untrained rural children.	Plans for 3 projects drafted after detailed needs analysis of community and resource audit of area. Consultation with communities was included.	Semi-skilled community members were identified by CSIR and trained further. Most CSIR staff remained in Pretoria – only 1 intermediary between rural and R&D cultures.	CSIR raised and held funds from DACST, DST and IDRC. Communities did not feel ownership of projects.	Full records stored digitally. Use of ICT for rural development was set up to be monitored from Pretoria. Should focus on training whole community, not a selected few. Teachers discourage ICT literacy in students because they see it as a threat to their status.	As soon as implementer (CSIR) left, each project died – lack of ownership by community. Neither sustainability nor scalability was established.

TABLE B. GHANA SURVEYS						
Project Details	Rationale	Project Plan and Implementation	Champions and HR skills	Funds	Monitoring and Best Practices	Sustainability and Scalability
GH1. Community Services Foundation CLTC at Lady Leach Library, Chiapatre, Kumasi	The Library existed. A CLTC was needed to help the community get abreast with IT development.	Planning has been good. The VP of Ghana visited the help and has promised to expand and build a special room for PC laboratory. UPENN used about 3 students from KNUST; UPENN students did all of the work with the local expert from KNUST. So far, only children have been targeted for training.	The project is administered by the Librarian. The trainers for the surrounding schools are teachers. There is one technician. One person is needed to train and coordinate related activities for children and workers. The place can be managed by the librarian.	Funding was from CSF, UPENN and others. Funding has not been adequate. There has been no additional funding and so the government has been paying for electricity for the center.	No reports of data collected to date but reports will be collected as from now. Basic literacy training will be self-paced tutorials. Supplied materials have enticed the users. The PDK package for adult education and the literacy online have been very helpful.	Opening a new one would be quite difficult due to government bureaucracy. Ghana Telecom's supply of phone lines will make the whole thing impossible.
GH2. Development Training Centre, Accra	There is a need for ICT in order to participate in the Global Teenager Project (GTP), a bi-annual program, taking place twice in a year through an Internet connection using e-mail and chat sessions	The high level of awareness has been of great help in the project planning. The ICT training component helped a lot. This was given to teachers before partaking in the project e.g. the website contest. Implementation process has been a two tier training process. Atlantic Computers train the trainers and the trainers in turn train the participants. For GTP the teachers select the pupils who participate	External resource persons are used from, for example, Busy Internet and Atlantic Computers	Funding has been quite adequate for the GTP project. For the sustainable development center – Business entrepreneurship, there have been no outside funds. Participants have been paying a token fee for the training to sustain the program	No information available	There are new funds for the project. It is a growing project. 3 schools joined just last week
GH3. Ghana Institute of Linguistics, Literacy and Bible Translation (GILLBT),	The development of literacy and bible materials in the local languages	Project plan for translation was pretty much as before except that there were less cycles to the office. Field	Basic IT skills were needed by field workers. A Sociology background at home base. A local	Funded by a private UK company. Funding was adequate enough to be balanced amongst the	There have been positive results so the practice will be expanded as materials become available	Time horizon is very long. The inputs are constant but expected. A new training facility is being built so that

Tamale		workers go during the dry season to test the material and return to home base to correct materials. Training is done in-house. Field worker enters and edits text as needed. They attempt to resolve problems by radio communication. If they cannot be resolved, worker must bring in the machine the next time they return to headquarters. Artwork has been digitized for new primers.	community member, young man, has also acquired basic PC skills	different regional languages. Separate languages require separate funding for example, Adele in the Volta, Kusal in the Upper East region. A US-based seed company provided some motivation and funding		it can be rented out. In as much as the process is not changed, yes, easily. However, implementation of new projects should be taken slowly
GH4. Schoolnet Ghana/National Educational Service, Accra	Learning of the students. CT are not the target but are necessary to accomplish the primary focus; the school network w/ the learning	Schoolnet Ghana parallels Schoolnet South Africa. Knowledge warehouse derives from teacher training and becomes a resource for them. Content resources are also provided. Primary up to JSS. 512 Secondary schools. Private schools teach 90% teach Win Word even DOS	Peace Corps. TDC in education often in World Links schools. They only relate to other Peace Corps volunteers. These programs come and go; volunteers may retain and continue the effort but may not. Alumni association; bring hardware no content or curriculum	No information available	No information available	National Educational Service will be providing funding for a national Snet program. Smaller projects could be successful but none are scalable
GH5. Community Services Foundation CLTC at Kwahu Daa, Kwahu-Daa Village (Eastern Region)	Wanted a typical rural setting, very remote, very small, no industry except for subsistence farming. They have been learning how to operate the computer for Word, but not for e-mail, or the Internet	Good. Good location and wiring of the room; very isolated from the environment. The set-up was planned and executed well. Location of this lab made it very convenient to set up. CSF knew all the players involved. Still,	The idea has taken up in the village; the pride is there for the people. People expect things to happen in their village, the telephone, senior secondary school and the library, for example. The attitude of the people made	Funding through the HP Digital Villages Project/ Univ of PA. Not sufficiently funded.	Data has been collected; no analysis has been done. Placement of the lab was perfect. The Set up was without problem	The lab is sustainable except for its location; accessibility is a bit restricted. The fellow in charge is not always around and it's not easy to enter the room. The income level of the people is so low that we are not even

		many of the early visits identified the issues and needs. Lab was placed in a private home after rewiring and sealing off moisture and dust; an air conditioning unit was installed. In 2002 the first 5 units were installed. This year the software and the machines were updated	the difference			expecting cost recovery. There is no money to sustain the project. We are able to break even because of earnings from other locations. We are sustaining KD from the CRI [Cocoa Research Institute Community Center, another CSF laboratory]
GH6. Church-based Computer Centre, Kumasi	Parish priest and church executive looking for a project during the 25 th anniversary celebration of the church decided to embark on a Computer Learning center to help the church members learn IT at the church. The church council accepted the proposal and a committee was set up.	The committee, after consultation with a number of companies, awarded the technical planning to a private company to install and run the Computer laboratory.	The committee is well abreast with IT. Many other members helped initially but fell out with time. Two members persevered and saw the project to the end.	The church provided the room and built the furniture and raised support. Also indicated that any organization that wishes to embark on such a project should be financially sound. For example a private company would demand payment for some services rendered from the church even though they are partners.	Have been operating for only 5 or 6 months. Some data on laboratory usage. Many Junior Secondary School kids registered in vacation for courses; had to run 2 shifts during the holidays. High level of awareness of the need for IT; many requests to acquire IT skills. Ample students for classes (most were already training in town) so it was a big plus for them. The church interviewed a number of prospective partners.	The lab was generating money from fees that the students were paying. The patronage was good. The computers were all used in stand alone mode. The lab is scalable.
GH7. Asante Akim Multipurpose Community Telecentre, Patriensa (Ashante Region) http://www.patriensa.com	To use it to address challenges in a rural environment	Set within the target community. Implemented in phases – IT phase, Health, Non-motorized transport	Highly trained personnel	Funding obtained through donations and loans from within the country and overseas groups	Still in its infancy, existing models were reviewed and modified	It's early to tell. But has the potential of being sustainable. It is scalable
GH8.	The CEDEP CLC	JTC trains the	The CLC was	Funding was	The management	Currently access

<p>Jachie Training Centre (JTC) for the Disabled, Jachie (Ashanti Region)</p>	<p>in Adum, Kumasi is situated on the top floor of a four-story building with no means of access for the disabled. This made JTC apply to CEDEP for this CLC to serve the disabled at their training center</p>	<p>disabled in wood work, tailoring, dressmaking, basket weaving, batik, tie and die, making orthopedic limbs. There are approximately 60 disabled students. This is the target community for this CLC. The general community from town is also welcome to use the CLC. Implementation has been good and taken care of their needs</p>	<p>commissioned in Oct 2002. Instructors are currently supplied by CEDEP from Kumasi for a three-year period. Local JTC instructors need training to run the center after the three-year period</p>	<p>provided by CEDEP. Funding is inadequate; they can still do with additional PCs to the eight currently at the center and also funding for Internet connection. Meanwhile USAID has promised them broadband Internet access</p>	<p>team of CEDEP and the local instructor may have data.</p>	<p>is free for the disabled. The community pay ₵10,000.00 for use and ₵50,000.00 for training per course (typing I, typing II, Computer Literacy, MS Word, Excel, and Access). It is too early to tell if the project will be sustainable. It's scalable, but funds are still needed for the center to purchase computers and an air conditioner and some other necessities for the center.</p>
<p>GH9. WorldLinks Organization, Accra</p>	<p>Used to be a World Bank funded project but now an NGO</p>	<p>In this year, teacher training on Integration of Technology into the curriculum (web) through e-learning, a pilot project running for 14 weeks has just finished with 100 teachers. Project planned with a mentor approach where each mentor had about 20 teachers to teach with the main mentors, 1 in Canada and another in the US.</p>	<p>Have adequately skilled personnel and have been doing face-to-face training and e-learning training for teachers participating in their programs</p>	<p>Inadequate funding. Grants were limited while under the World Bank, but now that they operate as an NGO, they can seek both grants and funding.</p>	<p>Data collected by the software used for e-learning training (Blackboard). Data available for general viewing, i.e. completion rate. Identified the need for a mixed approach in e-learning, i.e. supplementing web based teaching with a one-day face-to-face workshop to obtain a 64-completion rate for Ghana (as opposed to 0 from Botswana.) Need to motivate such participants with certificates on successful completion of project.</p>	<p>Project has just started. It is too early to tell.</p>
<p>GH10. Non-Formal Education Division (NFED), Ministry of</p>	<p>To eradicate illiteracy. To establish functional literacy reading and writing in the</p>	<p>Projects are action oriented, and require the community to undertake an action (e.g.</p>	<p>Have adequate specialists but they require in-service training with technology usage</p>	<p>Funding through credits, DFID, IDA, World Bank and other donor agencies.</p>	<p>Implementation process has been good. Use of radio programs for training and dissemination of</p>	<p>Depends on the involvement of the community from the beginning of the project and the</p>

Education, Accra	non-formal sector	drinking water project.) There is a five-step implementation process. A Central Training Team (CTT) together with other collaborating agencies (who sometime use ICT) train the Regional Training Teams (RTT) in the regional offices who in turn train the District Training Teams who in turn train the facilitators. They have an MIS (using Access/Excel) for collecting data in place in all the 10 regions.			information. Trainers do the training in the classroom and radio is used for reinforcement of what is taught in the classroom. Computers have not been used to a high level. Only the outside collaborators and consultants use the technology. Radio is also used for discussions and playback, for example on the Guinea Worm project.	empowering of the community to do things like maintenance and train on the community interaction with the project and also empowering them to make the decisions on the project.
GH11. World Vision CLTC, Bongo (Northern Region)	Originally set up for the use of children. Purpose is to improve the situation of children. The aim is to expose kids to computers. Global villages means that they have heard about it but have not met one.	Had plenty of business; had to turn it away because of bad connections. Have center and PC's, looking for VSAT. Will be open to students and adults. Free in general, small fee for workers.	Single individual did IT set up and support; sometimes hired others to do the bookkeeping and the desk duty at the labs.	All through private investment. No specialized funds. Small revenue generated from labs.	No data were kept. There is no Internet yet. But, measurement and data will begin after acquiring connection.	Eventually the original individual had to leave for the security of a regular job with an NGO. Lab is currently in flux.
GH12. CITRED University for Development Studies (UDS), Tamale	ICT literacy in the North as compared to the South is very different; the aim is to train as many people as possible including the hawkers; for them to sell their wares and put the North of Ghana on the map. That they can sell not only in Ghana but also to the rest of the world.	Interviewed people to put them on a web site so that they would be exposed to the world. CITRED was established because the founder knew that what had happened in southern Ghana could be done in the north. The center was established in a residential area precisely because	The director of CITRED was very involved; technical people were hard to come by; he only had one person to trust and funding was hard; he had to choose between family and the project; his family moved to Accra. He eventually sought better opportunities in the South.	The funding was always lacking since it had not attracted continued donor agency funding; the use fees paid for some of the consumables but computer time was sold cheaper than at any other center or cyber cafe. The founder had to construct and fund it himself	There is a collaboration w/ AID and AED and the British Council. They needed to keep a log of users and what info the people needed. It was a 6-month project with primary schools that would use the center for online counterparts in Britain; Pen pals and schoolmates. The output was a	Currently the project is not self funded along the line it needs to be so; the donors cannot continue to fund it forever. The project must generate the required funds The founder has a dream to replicate it in 3 northern regions. but it must be very, very successful in order to replicate

		<p>it had to serve the community. In its best times it had 24/7 access to the Internet (as a cyber café) and training for the community and school children. Two people took care of the services on a 24 hour schedule; they slept in the place since users would leave in the middle of the night and it was not unusual to get up by 6 AM and open the lab because there were people banging on the door.</p>			booklet of poems.	
<p>GH13. Global Teenager Project, Accra www.globalteenager.org.gh</p>	<p>Build Web and ICT capacity of teachers and students, and foster inter-cultural understanding</p>	<p>Detailed plan drawn up and currently being implemented</p>	<p>Competent HR base - being managed by 4 professionals, who are well versed in ICT in education.</p>	<p>Funding has proved inadequate.</p>	<p>Baseline survey prior to commencement. Ongoing evaluation being done by independent research group. "Learning by doing" nature of project is a "best practice."</p>	<p>Not clear how this project can become self-sustaining. Scalability is assumed rather than designed</p>

Table C. OTHER AFRICAN COUNTRY SURVEYS						
Project Details	Rationale	Project Plan and Implementation	Champions and HR skills	Funds	Monitoring and Best Practices	Sustainability and Scalability
OA1. Electronic Delivery of Agricultural Information to Rural Communities www.agricinfo.or.ug	Agricultural research results seldom reach rural farmers for utilization in improving agricultural production.	Participative planning with range of stakeholders in farmer education, plus telecentre staff at Nabweru, Buwama and Nakaseke. Good implementation.	Project Coordinator is trained agriculturalist and information expert. Others involved have community development experience.	Adequate funding provided by IDRC.	Baseline survey, mid-term and full-term evaluation included. Clear positive impact on farming communities in the 3 telecentres. Farmers acquired useful knowledge about best practices and high yielding seed varieties, but were unable to apply this knowledge	Plans to integrate project outputs into Uganda's National Agricultural Advisory Services program and into the Agricultural Research Information System of NARO
OA2. CD-ROM Malaria project at Manhiça Telecentre, Mozambique.	Empowering communities to make own CD-ROMs will help produce content relevant to local needs	Wide consultation to discuss CD-ROM production and choose focus. A university based Maputo team was taught the technical aspects	Ten local volunteers had never been involved in such a project before. They learned project planning skills, research skills, and how to make a CD.	UNESCO funding was sufficient, but took much longer than anticipated to be provided.	Learning processes were filmed to gather lessons learned. The training workshops were evaluated for their usefulness. For capacity building and technology transfer, funds are less important than the time needed for individual absorptive capacity.	Content that is locally relevant, and sensitive to language and culture issues, is essential prerequisite for sustainable development including all Africa's poorest communities.
OA3. Adaptive Technology for The Blind Ethiopia www3.sympatico.ca/tamru	Support the blind in utilizing ICT for learning and other activities. First project of its kind in Ethiopia	The planning has not catered for the lack of funding and skills, with serious impact on implementation	The HR skills and capacity have proven insufficient for the projects aims.	Inadequate funding from UNDP Trust Fund, UNESCO and others	No information available	No information available
OA4. Kivulu Centre Riruta Satellite, Nairobi, Kenya	Community-based center, opened September 2000, using participatory methods to	Project plans of high quality and well defined. But on paper only. The target populations are minimally	With government support, there are adequate and quality HR, at all levels of the organization	Adequate resources in terms of money, facilities (hw/sw, furniture's etc) and personnel.	Monitoring of the project and data collection is properly done. Target groups identified i.e. high school	Income generating projects create sustainability, and include: borehole water for sale, carvings

	identify needs and provide support and services.	reached. Much more to be done.			leavers and professionals needing ICT skills and facilities. Services are co-monitored by students and other beneficiaries through evaluations and suggestions. A problem is that the needs of the most needy in society are not addressed.	and artifacts, carpentry workshop, batik and tailoring. Students and other clients are paid -subsidized amount in fees, for the services offered, enabling continuity. Demand has grown tremendously.
OA5. Huruma Community Telecentre, Kenya Sponsors: Africa-online A. NCKK Software Technologies, British Council	Offer cheap Internet access and basic ICT skills to the poor (Mathare slums–youth) and access to information to NCKK health dispensary staff (where the telecentre is located).	B. Community workshops to identify information needs. Youths used as link between the information and community. Implementation via development of relevant courses and materials, then training.	Free skills development, maintenance and support was provided by partners. Youths who performed best were developed further as “trainers of trainers” and as champions of the project.	Funding was not adequate, but all the partners provided support, eg: Internet access, equipment, training support, software, and time)	A committee comprising the support institutions and members of the community monitored progress. Good practices included full community involvement, clear ownership and multiple services. However, old hw caused problems.	Long term sustainability is not assured – partners only committed for 3 years. Nevertheless, the center is being used as a model by NCKK for setting up more around the country.

Annex 2. South Africa: Survey compilation of key findings

Generalizations and Specific Responses

a) How does one determine which ICTs are most effective and for which set of problems?

The beneficiaries, especially from the poorest communities, have little if any experience of ICTs, nor do they appreciate their potential benefits. Hence, they are highly dependent on the project designers/implementers. This puts a major responsibility on the shoulders of these external agents, who should ensure that they clearly understand the problems and circumstances of the community in question, and guide the collaborative design of solutions via a range of processes, including:

- By building a relationship with and consulting the target beneficiaries;
- Identifying and assessing whether they have correctly interpreted and analyzed the community's needs;
- Considering and evaluating the status and effectiveness of any existing or potential ICT enabling infrastructure;
- Identifying possible solutions, and the possible ICT components of those solutions;
- Using participative processes to prioritize, select and present potential solutions to ensure community ownership and understanding;
- Continually assessing the impact of the initiative, and adapting the design and implementation plan according to new learning regarding community needs and feedback.

b) What is the nature of 'data' on projects/initiatives; how does one characterize the quality and credibility of data; and should one make decisions based on data collected to date?

Most South African projects have manually collected data regarding learner records, courses undertaken and subsequent career progress. However, these data need to be collected digitally, and further qualitative and quantitative data are needed:

- Data collection, monitoring and evaluation need to be built into the initial project design for all projects.
- Much more work needs to be done on continuously assessing the broader impact (both direct and indirect) of each project on not only the individuals using the services provided, but also on the wider community.

c) What is the role of 'vision' in the success/failure of projects? Do specific projects link to broader vision?

The overall vision for all initiatives involved the improvement of the quality of life, poverty alleviation, and sustainable development through ICT, with particular emphasis on the provision of quality, equitable and relevant education for rural areas. Vision was seen as being very important, aimed at:

- Keeping the implementing staff focused and on track.
- Giving purpose and cohesion to all projects, especially to the many volunteers.
- Helping all involved to keep the big picture in mind, understanding that all of these initiatives were primarily about the people, and that ICT is simply a means to an end.

d) Push vs. Pull issues: To what extent has ICT been exploited via supply-side policies, vs demand-side needs?

Since poor communities lack knowledge about ICTs and their benefits, the external agents need first to create awareness and understanding – a benign ‘push’ process. This should motivate the local people and establish buy in for any ICT involvement. Once that understanding is established, the communities should be encouraged to ‘pull’ by articulating their needs.

e) In what ways is/isn’t current research addressing ITEPA issues?

Most respondents did not know of any research on how ICTs can benefit the poorest people, but indicated that it represents a serious need.

f) How strategically is ICT being implemented/designed in Africa? (From local institutions vs. from international/donor perspectives)

Since most of the respondents were working in the remote communities, they were not aware of the strategic use of ICTs beyond their sphere of activity. They know it is essential, and would like to contribute to future strategic processes.

g) In what ways do/don’t implementers of ITEPA projects ‘respect’/understand the capabilities (skills/literacy/problem-solving, attitudes, values) of the end user and local communities?

Generally most project sponsors still do not sufficiently understand such capabilities. However, the few designers/implementers who genuinely consult and involve the target beneficiaries show that it is more than possible to understand and respect the needs and capabilities of local communities, with beneficial results.

h) How much attention is paid to collective/community involvement as contrasted with individual end-user involvement? How important is this distinction, and how variable is this across projects?

All respondents said it is a matter of a balance between the two. While most chose to focus on the community *per se* since it increases chances of sustainability and has broader impact, sometimes they must focus on empowering individuals as examples or champions. But it is important that in empowering the individual the implementers do not create a celebrity culture which will divide rather than unite the community.

i) In what ways do ICT programs create negative outcomes (e.g., excessive expenditures for non-practical purposes; providing window-dressing for policy makers rather than real development consequences; poorly designed purchases; biases toward particular approaches/technologies; cycles of throwing good money after bad)?

The general response was that ICTs have positive outcomes. However, the possible outcomes that caused most concern were:

- If the ICTs were imposed without the involvement of the community;
- If the initiatives were used a mechanism to dump outdated/surplus/unusable technologies;
- If ICTs were used to train just a few of the poor, creating another elite class, and reinforcing the current ‘divide and rule’ situation.

j) How important is cross-institutional collaboration (local, national, regional, international), and how does this vary by project or by policy approach. (e.g., some telecentre approaches exist under ICT ministries, but don't connect with education ministries)?

It is very important to have collaboration between the private sector, public sector, donor community and poor communities. This will promote the strategic deployment of ICTs to enhance social, economic and scientific development at reasonable cost, with minimal duplication and wastage of resources, and with widespread sharing rather than competition.

k) Is there a range of pilots that are 'under the radar', or maverick projects (concepts, individuals, organizations which are not sanctioned/favored by authorities), and therefore have not been explored/evaluated?

At the community level, most ICT initiatives are viewed, in any case, as strange until local people understand their worth.

l) It has been claimed that there are too many 'Pilot' projects: Do you agree or disagree, and why/why not? Are there better alternatives to pilot projects (cite examples)?

Yes and no:

- Yes, in that there are too many ICT projects where donors are pursuing their own interests.
- Yes, in that pilot projects allow designers/implementers to avoid the responsibility of ensuring that their projects are sustainable.
- No, in that before attempting 'big bang' implementation, donors need prototype phases (pilots) to gain experience and identify what works and what does not work.

Perhaps instead of pilots, all major initiatives need a clearly defined development phase, but holistically structured such that there is move towards wider implementation and long-term sustainability.

m) What level of scale (systemic infrastructural investment) is needed to assume an appropriate context for development?

This appears to be greatly underestimated:

- Much more needs to be done to provide buildings, security, water, electricity, transport, roads, telephone lines, maintenance, Internet connections, wireless connections, modems.
- Creating the right organizational framework is also extremely important.

n) How 'indigenous' is the ICT 'sector' in Africa (nationally, regionally, and continentally), and what are its potential consequences?

Currently, Africa is viewed effectively as an ICT "colony" of the USA and EU:

- The need is to create the capacity to develop indigenous ICT products and services in Africa, i.e., ICT for Africa by Africans, especially the rural people to meet their needs.
- African governments need to re-evaluate the regulations that hinder African people, especially the poorest, from initiating indigenous ICTs.
- Initiatives which introduce local language based ICT applications are likely to be the first step towards creating an indigenous ICT sector.
- If ICTs were indigenous it would stimulate the emergence of genuine local information societies in rural areas and, later, could impact the global economy.

Annex 3. Survey Results of Three Specialists

As per the acknowledgements, three leading specialists from South Africa were interviewed in depth as to their views on ITEPA-like projects in sub-Saharan Africa. These individuals (Peter Benjamin, Neil Butcher and Tina James) have extensive experience across Africa and internationally, and each provided a rich set of experiences and comments. In order to protect promised confidentiality of individual views, we have provided herein a mix of their comments, but without specific attribution.

a) How does one determine which ICTs are most effective and for which set of problems?

Experience shows that ICTs cannot be the starting point for successful development initiatives in poor communities. Instead, the appropriate ICTs, often in combination, become apparent only after a variety of other processes have been initiated, including:

- Needs analysis, fully involving communities in general, and target groups in particular, depending on the project. Reinforcing existing patterns of communication and information flows in the communities/groups involved makes a good starting point.
- Preliminary awareness creation of the potential benefits (and inappropriate expectations) of ICTs within the target community/groups.
- Identifying local champions and implementers, and providing them with the appropriate skills (ICT and many other), as well as support resources (real and virtual).
- Developing clear, realistic, but flexible project design(s), co-owned by all stakeholders.
- Including monitoring and evaluation as fully funded ongoing components of the initiative – and responding early with necessary changes in response to problems/issues exposed. This means accepting significant time overheads. Outcomes and impacts should be based on a wide range of views from community users and indirect beneficiaries, not only the educated, better off people in positions of community authority.
- Once the above processes are underway, ICTs can be introduced. However, the approach should be ‘trial-and-error’, with a willingness to listen, learn and change. Too many ICT for development initiatives have placed ‘sustainability’ too early on the agenda, rather than adopting more of an ‘incubator’ approach – setting up several prototype models.

If initiatives are set up systematically following the above guidelines, comparability of tools and approaches will be much easier to achieve in future.

b) What is the nature of ‘data’ on projects/initiatives; how does one characterize the quality and credibility of data; and should one make decisions based on data collected to date?

Generally, data gathered in this area are still limited and partial, and often inadequate for decision making. However, even limited data gathered should be consulted as part of a broader process of project planning:

- At the micro, individual project level, good information is emerging about use of ICTs. Case studies provide a rich source of anecdotal information about project successes and failures.
- Data at a systemic level, however, remain of much lower quality.
- The quality of data depends on the project management training provided: why data are important; how and why they should be measured; how data can be used to improve projects.
- The inherent fears associated with any type of monitoring/assessment (particularly strong in Africa for a variety of reasons) need to be overcome.

- Much data reflects the larger problem that most projects are designed around ICTs instead of ICTs being seen as a set of tools to help to solve a real problem. The research/data gathering should use the central problem as the starting point.
- Many projects are “set up to fail” because of unrealistic goals and objectives imposed by donors. Hence, measurable targets are often not set, and meaningful data are not obtained to determine what the project has achieved.
- Currently, inadequate attention is paid to longitudinal research that cuts across projects, compared with too much evaluation of individual projects narrowly focused on the use of donor funds.
- Some useful reference points: see www.communitysa.org.za. IDRC-Acacia has done extensive research including: ‘ICT for development in Africa: Opportunities and challenges for community development’, ed. Ramata Molo Thioune, 2003; Also ‘ICTs and Poverty: A literature Review’ Nyaki Adeya, 2003. Both available through IDRC website www.idrc.ca.

c) What is the role of ‘vision’ in the success/failure of projects? Do specific projects link to broader vision?

The role of ‘vision’ and the quality of that vision is critical in the success of projects. Too many projects fail because the vision is established without reference to the context of implementation. Instead, projects need to develop a shared vision between those funding the project, those running it, and those intended to benefit from it. Some useful examples amplify these issues:

- National Schoolnets have been initiated in many African countries over the past 5 years, providing good examples of individual projects linking to a wider vision.
- NEPADs e-Schooling vision is being evolved centrally, and could become a major catalyst for driving rollout of ICTs into education systems by providing high-level political commitment. However, the critical next challenge is to develop that vision in much greater detail and much more inclusively, particularly by involving the expertise and experience of the many Schoolnets.
- The original vision of Gauteng Online was to soundly link economic development to the availability of ICTs in schools. However, this vision seems to have been superseded during implementation by artificial rollout targets, with little attention being paid to developing a common vision amongst project participants at all levels.
- At the highest level, much ICT rollout on a large scale is pointless until fundamental national infrastructure is provided, e.g. water, roads, electricity. This requires high-level political commitment, without which vision at lower levels is irrelevant. For example, in some remote communities in the USA, politicians took this issue on and provided electricity where it could never be justified financially.
- Reference point: There are some good sections in the IDRC School Networking book on this. Refer also to the Policy Handbook on systemic issues, and thinking big.

d) Push versus Pull issues: To what extent has ICT been exploited via supply-side policies, versus demand-side needs?

Since the mid-90s there have been many ICT for development projects designed with a significant ICT inputs, but often with little understanding of the demand-side dimensions. But this is a complex issue, since people in poor and disadvantaged communities have had little opportunity to experience or understand the benefits of ICTs. Thus, ICT projects require a sophisticated balance between creating awareness of new possibilities and taking context and needs into account:

- Two different phenomena are generally seen in Africa: a relatively small number of larger supply-side projects (e.g. ITU, USA) that ‘suggest’ technology approaches; and thousands of small micro-entrepreneurs setting up phone-shops, cyber-cafes etc.

- However, some projects have existed for some time with a relatively balanced approach, e.g. Schoolnets, which are genuinely appreciated by national governments and local schools/communities, and supported by international donors.
- Recently, there seems to have been a swing away from supply-led initiatives, with ICTs becoming integrated (as an enabler) into demand-led donor programs in such areas as: the environment; civic participation; human rights; job creation.

e) In what ways is/isn't current research addressing ITEPA issues?

- Projects are generally still targeting the urban/peri-urban/more easily accessible communities (including schools) primarily because donors avoid the higher risk projects.
- Most current research is based on one of two tacit assumptions that require a major organization (public or private) to be the main mover:
 - *Commercial*: If profitable business models can be found for community ICT projects, significant private sector investment can be attracted.
 - *Social good*: If we can only make it clear to Africa's leaders just how important and valuable ICTs can be across all aspects of society, then a government or major donor should provide significant funding.
- Little research is being done on how ICT can support existing local information and communications flows generally, and on local initiatives in particular that build on social entrepreneurs' ability to respond to local needs. We need to learn what incentives can be found for them to provide ICT services more broadly within and between their communities.
- There is a growing need for well designed longitudinal research measuring impact over longer periods (5-10 years), focusing on the core problems of the poor (which are not about the ICTs themselves) and then assessing objectively what role different ICTs might play in solving those problems and how contextual conditions affect this.

f) How strategically is ICT being implemented/designed in Africa? (From local institutions vs. from international/donor perspectives)

Broad strategic thinking about where ICT deployment is taking education systems is in its early stages. To date, most work has been by early adopters persuading others that investments in educational ICTs is justified (e.g. Schoolnets), but now more holistic strategies are needed:

- There are several examples where the imposed strategy of donor agencies is at odds with that of national government education agencies. However, there are other examples where the donor agency works carefully to ensure that its vision is in alignment with the needs of the local institutions.
- Although the IDRC's Acacia program (1997- 2000) focused strategically on a few countries via 4 pillars (policy; implementation; projects; monitoring and evaluation), the present situation stills shows a fragmented donor community.
- At the country level, there is little integration of ICT and education issues across various government departments in most African countries.
- Of equal importance as a clear, holistic ICT strategy, is a strategic project facilitator skilled in balancing the competing strategic imperatives of all participants.

g) In what ways do/don't implementers of ITEPA projects 'respect'/understand the capabilities (skills/literacy/problem-solving, attitudes, values) of the end user and local communities?

In most cases there is a good understanding of what people can do at the local level. Those bodies that work through local organizations, building capacity as a part of the project clearly have a better chance of respecting local conditions. Yet those projects that do try to develop this understanding often fail due to flawed project design where ICT and its rollout are made central:

- Funders and project implementers usually have unrealistic expectations of ICT diffusion and adoption in communities. It has proved difficult to ensure sustainability of projects at the community level where the full adoption of information and ICT literacy takes significantly longer than donor timeframes.
- Experts need to focus much less on ‘delivering’ and much more on developing capacity, with the acceptance that this is more expensive and time consuming than delivering technology, and that it has fewer immediate, tangible results.
- Current momentum is moving from the early adopter phase to the capacity development phase, so more people can run effectively locally with their own ICT projects.

h) How much attention is paid to collective/community involvement as contrasted with individual end-user involvement? How important is this distinction, and how variable is this across projects?

This is highly variable across projects, depending on the project design. There is a growing tendency to use participatory rural appraisal approaches to project design, which suggest a growing interest in community involvement. But this is expensive and slow, and does not always guarantee success:

- It’s very important to understand where a community stands on this before work commences on a project. It cannot be assumed that the community will benefit from activities carried out by specific individuals:
 - The USA applications were in most cases received by CBOs to set up telecentres to benefit communities. A few years later, those few that were successful saw individual ‘entrepreneurs’ emerging who then benefited financially from their hard work. This created huge tensions in communities who expected the financial benefits to spill back into the communities.
 - In the case of the Swaziland Computer Education Trust, the success of the project can be put down to being driven by a ‘social entrepreneur’ – someone who thinks and acts as a business person, but is driven by social goals.
- The strength of ‘community’ projects reflects directly the cohesion of the community organizations that are worked with, which varies greatly.
- A serious problem in African ICT projects is that indicators of success are usually too high. The need is to create a critical mass of local champions who can become responsible for balancing community and individual needs.

i) In what ways do ICT programs create negative outcomes (e.g., excessive expenditures for non-practical purposes; providing window-dressing for policy makers rather than real development consequences; poorly designed purchases; biases toward particular approaches/technologies; cycles of throwing good money after bad)?

The question of whether or not ICTs have positive social impacts and real development outcomes is complex. The data is not available, and we don’t have enough understanding of long-term outcomes and impacts. Many of the problems stem from (a) having no big picture, and (b) not viewing ICT as one of many *potential* enablers:

- Key problems often arise when the project recipients/participants were originally passive rather than agitating for involvement. This relates to the key issue that projects often reinforce dependencies, a difficult cycle to break.

- Project planning frameworks are needed where money is only spent when the project participants are ready, rather than spending it prematurely because of the artificial time frames of governments and/or donors.
- It is ironic that rural communities are expected to adopt ICTs in a few months, when experience from the work environments in many developed countries indicates that even the use of e-mail takes years before properly integrated into other workflows.
- In many African countries, until there is adequate top-down emphasis on improving ICT infrastructure into underserved areas much funding will be wasted on ICT projects that will struggle to grow beyond the pilot stage.

j) How important is cross-institutional collaboration (local, national, regional, international), and how does this vary by project or by policy approach. (e.g., some telecentre approaches exist under ICT ministries, but don't connect with Education ministries)?

Collaboration is crucial, but is as strong as its weakest link. There is also a danger of over-complicating projects by involving too many partners. However, collaboration can add enormous value when harnessed successfully:

- Collaboration is difficult in many African countries with many vested interests, where government departments are seldom rewarded for collaborating, their budgets are separate and there are few national ICT strategies to tie them together meaningfully.
- Despite NEPAD and SADC, far too little is being done regionally and donor fragmentation adds to lack of collaboration.
- Community ICT infrastructure has impact only when real community information and communications flow through the equipment. Where the ICT/Telecommunications ministry acts alone, projects often do not get beyond equipment with limited usage.

k) Is there a range of pilots that are 'under the radar', or maverick projects (concepts, individuals, organizations which are not sanctioned/favored by authorities), and therefore have not been explored/evaluated?

Such projects exist, but effective research (not project specific research) is needed to uncover them. In particular, there is little research on the many phonestop/cybercafe/telecentre private initiatives that have received little or no external funding or policy support. A research agenda is needed that looks beyond the obvious, to find examples of self-funded ICT projects. However, this is no small research challenge, and innovative project design will be required.

- Reference note: There are some individual projects, such as the e-Initiative Foundation in Namibia.

l) It has been claimed that there are too many 'Pilot' projects: Do you agree or disagree, and why/why not? Are there better alternatives to pilot projects (cite examples)?

A climate is needed in which innovations, pilots, and other micro-level interventions can flourish and be supported, yet:

- There is too much focus on initial one-off pilots, with little shared learning.
- Pilots are useful for testing innovation, but often flawed because their success resides usually in the efforts of a small group of committed individuals. This makes sustainability and scalability difficult to achieve in practice.
- Small scale testing remains important, but, in addition, efforts are needed to establish different interventions at different levels.

m) What level of scale (systemic infrastructural investment) is needed to assume an appropriate context for development?

There are major systemic requirements beyond the basics of electricity, water, roads, and telephony:

- The difficulty of obtaining connectivity in rural areas (low bandwidth, and high cost) depends on the long-term issue of telecommunications reform. The agreement that SchoolNet and African governments are trying to negotiate with VSAT providers could have major impact, especially on the poorest areas.
- Commitment is needed to ICTs for development across a wide range of sectors, not just within government.
- Policy focus needs to shift away from trying to implement (i.e. scale up successful small-scale interventions) towards *creating an enabling environment*.
- A “Community ICT Service Brokerage” is needed to provide training, links to computer refurbishment and OSS organizations, business ideas and templates, links to useful info, and assistance with local content creation.

n) How ‘indigenous’ is the ICT sector in Africa (nationally, regionally, and continentally), and what are its potential consequences?

At one level, there is now much greater policy awareness in ICT issues, and many people and governments are working on building an ‘Africa Information Society’. However, the ICT sector is not very ‘indigenous’ in terms of location of production, the skills base is scarce, and most of the models for ICT usage are from outside Africa:

- While many local businesses and entrepreneurs are starting up, mostly this ICT industry comprises branches/satellites of multinational companies.
- There is a need to create demand for certain indigenous services. For example, there are not yet compelling systemic reasons for most schools to sustain ICT investments. These need to be built, through policy, through capacity-building, and through evolving relevant applications.
- Currently, little of the content that is accessed through the systems is African (especially in local languages), and there are few active networks for Africans to tap into the knowledge that exists within Africa to meet African challenges.

o) Other issues that you think are important may be added here (as much as you like)?

- Intellectual Property Rights: Who owns the information that is created electronically in Africa. In particular, can ways be found to develop community ownership of information?
- There are 2,300 languages in Africa. How can ICTs tools be developed for individual/organizations/communities to represent the range of cultures and languages on the continent, and link up with others (especially Africans in the Diaspora)?
- The presence of local champions operating as social entrepreneurs within the systemic model of a ‘local information society’ appears to be central to many of the above generalizations.

Annex 4. Findings from Other African Countries - Electronic Survey Findings

Below follows a compilation of findings from the short (e-mailable) survey completed by five specialists in Southern and Eastern Africa.

a) How does one determine which ICTs are most effective and for which set of problems.

Empirical baseline surveys should be carried out initially, including:

- problem identification;
- target group(s);
- socio-economic structure of community;
- demos;
- assessing information needs;
- current means through which information is acquired, and satisfaction/problems with those means;
- quality and management issues;
- assessing technologies people are most comfortable with.

Data capture and development are indispensable to accurate planning and resource allocation and delivery, but they are inevitably time consuming exercises. Most projects in Africa do not include a monitoring and evaluation component. Data are often based on quantitative and not qualitative indices yet the latter often better indicate the issues that need to be understood in Africa. Also, data may be biased and distorted for political or economical motives. Therefore data validity should be considered with care. What is the nature of 'data' on projects/initiatives; how does one characterize the quality and credibility of data; and should one make decisions based on data collected to date.

Different user categories often have different ICT preferences. Some groups are most comfortable with traditional technologies e.g. print, radio, TV/video and telephone. The convergence of old and new technologies should be tested e.g. Internet broadcasting etc. Mechanical radios, solar power etc also should be considered. Radio is seldom considered as an ICT, let alone the most widely accessible ICT. Technology Enhanced Learning initiatives are initially seen as threatening interventions by most teachers, even in the developed economies, but especially in the developing world where the skills base is very low. Such perceptions need sensitive management, or they will render any ICT intervention non sustainable.

To achieve universal access, choice of the medium of delivery is crucial. Some argue that it has to be the most widely available ICT (i.e., radio), whilst others argue that it should be the quality of content and learning materials that should drive carrier technology decisions, and not vice versa. The importance of local languages should not be under-estimated.

In most countries in Africa, and especially in the rural areas, basic services are lacking or inadequate, including:

- Education
- Health
- Water
- Food
- Infrastructure including road and electricity.

ICT projects which positively affect any of the issues above may be worth implementing. However, these projects should fit holistic strategies that impact on all the above via broad community involvement, and even have further positive (indirect) impacts, often leading to sustainability in the medium term.

b) What is the role of ‘vision’ in the success/failure of projects. Do specific projects link to broader vision?

Vision is a pre-requisite for all projects to succeed, with each individual project *working up* to the larger whole, although providing value in themselves. Each (sub)project should be seen as a value frame that fits into the larger vision. Specific projects must link to the broader vision, which, like an elastic band, must be able to serve at various levels without undergoing drastic changes, responding to needs as they arise.

Bottom-up demonstration activities (e.g., Schoolnet, Telecentres, etc) and holistic Information Society policies are needed in parallel. As the processes evolve, the two converge, with the demonstration activities providing lessons for the Policy to address and the Policy process scaling up the successful demonstration projects.

Vision can only be achieved with a committed individual or individuals, most especially the organizational leadership.

c) How strategically is ICT being implemented/ designed in Africa? (From local institutions vs. from international/donor perspectives)

The perception is that, historically, strategies have been largely driven by the agendas of the international community. A more balanced approach is needed. Ideally, international organizations and donors should work at the policy level to influence the national decision makers, loosening their grip and opening the doors for the poorly appreciated impact of ICTs to expand into the poorest communities. There are signs of change, with more involvement of local organizations, governments, and the private sector in projects which are therefore being addressed in a more holistic manner.

In many cases, lip service only is being paid to strategic plans for reaching the poorest communities. Far too little attention is being paid to: ICT Infrastructure; unreliable telephone networks; poor telephone lines; high costs of Internet access; concentration of ICT in urban centers.

In Africa, the ‘old technologies’ have not yet arrived in most institutions, let alone the new technologies. Implementation of ICTs has often been erratic, ill conceived, poorly conceptualized and more often than not, inappropriate for achieving the proposed objectives. ICT Strategies in Africa are constrained by lack of awareness of the cross-cutting impact of ICTs among most policy and decision makers. Hence, complex issues such as privatization of telecommunication sectors, and Voice over IP are often poorly handled.

d) In what ways do/don’t implementers of ICT projects for the poor ‘respect’/understand the capabilities (skills/literacy/problem-solving, attitudes, values) of the end user and local communities?

Implementers are constrained by the funding timeline and hence cannot move at the community pace. Many assume that they know what the poor want, and don’t respect the social ethos of the communities they work in. Often, ICTs are imposed on communities by international donors leaving little room for

adaptation to suit the immediate and pressing community needs. Ridiculous deadlines and timeframes characterize such projects “handed down from above.”

It should be recognized that ICTs are new to communities and it takes time to demystify them and integrate them with old technologies if they are to be embraced by the communities. They need to take into consideration local cultures, values, attitudes, and language. Often, few community members understand what ICTs can offer. It is understandable that there might be a difficulty in assessing the skill level of the recipient community but this should not be used as a basis for excluding them from the design process.

Some implementers are constrained by outmoded concepts of literacy, interpreting poor reading and writing skills as a general inability to communicate in other ways, solve problems, and to effectively act as farmers and entrepreneurs.

Local managers of telecentres (mostly young because they like to work with computers) struggle to collect money for services provided to some of their poor neighbors, obviously affecting sustainability.

e) How much attention is paid to collective/community involvement as contrasted with individual end-user involvement? How important is this distinction, and how variable is this across projects?

If there is a balance between both community and individual benefit, then it is a recipe for success, since such a win-win approach produces sustainable projects and contributes to holistic development. When representatives of different community groups are involved, there is a multiplier effect and the whole community identifies with the project. This leads to broad ownership, which is pivotal for success and sustainability.

Telecentres by their very rationale are ostensibly set up for disadvantaged communities otherwise unable to afford access to ICTs. Yet these facilities are all too often placed under the whip of ‘self sustainability’ which conflicts with reaching the poorest of the poor. Planning and management of long term sustainability strategies is often neglected.

f) In what ways do ICT program create negative outcomes (e.g., excessive expenditures for non-practical purposes; providing window-dressing for policy makers rather than real development consequence; poorly designed purchases; biases toward particular approaches; cycles of throwing good money after bad)

The literature on ICT projects (both state and private), is rampant with negative outcomes, generally due to poor conceptualization, consultation with communities and stakeholders, for example:

- Few African governments provide the necessary financial support or support infrastructures for survival of ICT projects, as they are invariably preoccupied with more pressing economic and social issues.
- Incorrect design and implementation can waste scarce resources which could otherwise be used to alleviate serious problems of the community, as well as cloud the thinking of decision makers and communities regarding the potential benefits of ICTs.
- Implementers and funders sometimes use ICT projects as tools to achieve their goals, forcing inappropriate ICTs on communities with inadequate needs analysis.
- Issues of content are often downplayed and allocated inadequate resources.

- g) Is there a range of pilots that are ‘under the radar’ or maverick projects (concepts, individuals, organizations which are not sanctioned/favored by authorities), have not been explored/evaluated.**

Some strongly believe that there are particularly concepts that are creative, but outside the normal and acceptable paradigms. Paradigm shifts in support of innovation in project formulation are mostly driven by individuals close to (or from within) the poor communities themselves, rather than the established major development agencies.

- h) How ‘indigenous’ is the ICT ‘sector’ in Africa, and what are its potential consequences?**

ICT projects in Africa still are largely based on experience gained in developed world environments – this prevents re-inventing wheels, but assumes similarity of circumstances. However, there is need to apply solutions to our practical problems which “imported” solutions do not adequately address; e.g. relevant local content, in local languages. A more holistic approach could bring about indigenous solutions to Africa’s unique technology requirements.

Arguably Africa’s ICT sector is not indigenous and uptake of ICTs has been slow. South Africa would undoubtedly have made the most strident moves in this direction; large tracts of the country remain void of any well entrenched ICT sector and access. African ICT skills need to be nurtured, e.g. for:

- refurbishing computers;
- ICT content in local languages;
- connectivity options that are reliable and affordable are yet to be tried, tested and proven for rural and remote.

Annex 5. Full ITEPA Survey Questionnaire (face-to-face)

ITEPA Survey Questionnaire

Draft version (10 May 2003)
 Copyright ITEPA/Bob Day and Dan Wagner
 Project funded by Imfundo (DFID)

Background: The ITEPA project is designed to provide a framework for supporting an initiative that will gather evidence on “*what works*” (and, conversely, *what doesn't work so well or at all*) in existing and upcoming efforts to use ICTs with poor (and very poor) populations in South Africa and Ghana (and possibly other African countries), thereby providing an improved knowledge base as a platform for enhanced ICT-based educational activities. This Questionnaire is part of the effort to collect up-to-date think and data on this goal.

Please keep in mind three desired dimensions in filling out this Questionnaire:

- a) your opinion (based on data, anecdote and your ‘gut’ feeling),
- b) empirical data (including policy documents) that have been collected (including references and/or URLs),
- c) any people the ITEPA team should follow up with.

THIS SURVEY HAS BEEN COMPLETED BY _____ ON ____/____/2003.

Please fill in below with your electronic response, and save the document with your name at the front of ‘itepa’; e.g. Yourname.itepa.survey.doc

1. SPECIFIC EXAMPLES (MAINLY PROJECT FOCUSED)

Background: In what ways can ICTs help the poorest of the poor—this is the ITEPA goal. Cite examples and your view of the effectiveness of each approach and subcomponents of each approach (e.g. cellular telephony, telecentres, cybercafes, ‘hole in the wall’, school connectivity). Examples of Good, Bad and Ugly projects: why are they labeled as such, and which should be revisited.

- a) Name of project (principal person/sponsor)
- b) Rationale for the project
- c) Quality of project plan (including reaching of target population)
- d) Was the funding adequate/appropriate; how obtained?
- e) Quality/skills of human resources (champions, etc)
- f) Implementation process
- g) Results/monitoring/evaluation/data collection. Was adequate data/monitoring undertaken? And comparisons to ‘outside world’ data, and compare with data to other comparable projects.
- h) Was this project sustainable?
- i) Was this project ‘scalable’?

- j) Were ‘best practices’ identified; if so, what were they? If not, why not?
- k) Were there ‘worst practices’ (things NOT to do)? Cite examples
- l) Other issues?

2. GENERALIZATIONS AND VIEWS

These should be drawn from the broad African context, although South Africa, Ghana examples would be most helpful.

- a. How does one determine which ICTs are most effective and for which set of problems.
- b. What is the nature of ‘data’ on projects/initiatives; how does one characterize the quality and credibility of data; and should one make decisions based on data collected to date.
- c. What is the role of ‘vision’ in the success/failure of projects? Do specific projects link to broader vision?
- d. Push vs. Pull issues: To what extent has ICT been exploited via supply-side policies, vs demand-side needs?
- e. In what ways is/isn’t current research addressing ITEPA issues?
- f. How strategically is ICT being implemented/designed in Africa? (From local institutions vs. from int’l/donor perspectives)
- g. In what ways do/don’t implementers of ICT projects for the poor ‘respect’/understand the capabilities (skills/literacy/problem-solving, attitudes, values) of the end user and local communities?
- h. How much attention is paid to collective/community involvement as contrasted with individual end-user involvement? How important is this distinction, and how variable is this across projects?
- i. In what ways do ICT program create negative outcomes (e.g., excessive expenditures for non-practical purposes; providing window-dressing for policy makers rather than real development consequence; poorly designed purchases; biases toward particular approaches; cycles of throwing good money after back)
- j. How important is cross-institutional collaboration (local, national, regional, international), and how does this vary by project or by policy approach. (e.g., some telecentre approaches exist under ICT ministries, but don’t connect with education ministry)
- k. Is there a range of pilots that are ‘under the radar’ or maverick projects (concepts, individuals, organizations which are not sanctioned/favored by authorities), have not be explored/evaluated.
- l. It has been claimed that there are too many ‘Pilot’ projects: Do you agree or disagree, and why/why not? Are there useful alternatives to pilot projects (cite examples).

- m. What level of scale (systemic infrastructural investment) is needed to assume an appropriate context for development).
- n. How 'indigenous' is the ICT 'sector' in Africa, and what are its potential consequences?
- o. Other issues that you think are important may be added here (as much as you like).

POSTSCRIPT: PLEASE DO NOT FORGET TO PROVIDE SPECIFIC REFERENCE/URLS TO ANY SPECIFIC DOCUMENTS OR PROJECTS THAT YOU REFER TO ABOVE.

Annex 6: Short (e-mailable) ITEPA Survey Questionnaire

ITEPA Short Survey Questionnaire

Revised version (27 July 2003)
 Copyright ITEPA/Bob Day and Dan Wagner
 Project funded by Imfundo (DFID)

Background: The ITEPA project is designed to provide a framework for supporting an initiative that will gather evidence on “*what works*” (and, conversely, *what doesn't work so well or at all*) in existing and upcoming efforts to use ICTs with poor (and very poor) populations in South Africa and Ghana (and possibly other African countries), thereby providing an improved knowledge base as a platform for enhanced ICT-based educational activities. This Questionnaire is part of the effort to collect up-to-date thinking and data on this goal.

Please rest assured that your anonymity will be observed at all times. The report that we will submit to Imfundo will not make direct attributions to any respondent's personal perspectives, unless you specifically request that we do so. Unless you tell us otherwise, we will list you in appreciation for your inputs to the overall report. Naturally, we will also send you a copy of the draft report for you further comments, if you so desire.

Please keep in mind three desired dimensions in filling out this Questionnaire:

- a) your opinion (based on data, anecdote and your own personal feeling),
- b) empirical data (including policy documents) that have been collected (including references and/or URLs),
- c) any very special people the ITEPA team should follow up with, and their electronic contact details.

THIS SURVEY HAS BEEN COMPLETED BY __ (PUT YOUR NAME HERE) ____ ON ____ / ____ /2003.

INSTRUCTIONS FOR COMPLETION:

- PLEASE FILL IN BELOW WITH YOUR ELECTRONIC RESPONSE, AND SAVE THE DOCUMENT WITH YOUR NAME AT THE FRONT OF 'ITEPA'; E.G. YOURNAME.ITEPA.SSURVEY.DOC
- PLEASE EMAIL YOUR RESPONSE AS AN ATTACHMENT (EITHER MSWORD OR RTF FORMAT) TO bday@scientia.co.za AND wagner@literacy.upenn.edu

1. SPECIFIC EXAMPLES (MAINLY PROJECT FOCUSED)

Background: In what ways can ICTs help the poorest of the poor—this is the ITEPA goal. Cite examples and your view of the effectiveness of each approach and subcomponents of each approach (e.g. cellular telephony, telecentres, cybercafes, ‘hole in the wall’, school connectivity). Examples of Good, Bad and Ugly projects: why are they labeled as such, and which should be revisited.

- a) Name of project (principal person/sponsor)
- b) Rationale for the project
- c) Quality of project plan (including reaching of target population)

- d) Was the funding adequate/appropriate; how obtained?
- e) Quality/skills of human resources (champions, etc)
- f) Implementation process
- g) Results/monitoring/evaluation/data collection. Was adequate data/monitoring undertaken? And comparisons to ‘outside world’ data, and compare with data to other comparable projects.
- h) Was this project sustainable?
- i) Was this project ‘scalable’?
- j) Were ‘best practices’ identified; if so, what were they? If not, why not?
- k) Were there ‘worst practices’ (things NOT to do)? Cite examples
- l) Other issues?

2. GENERALIZATIONS AND VIEWS

These should be drawn from the broad African context. If you have time constraints, please answer at least five of the questions below – i.e. those that you feel most strongly about.

- a) How does one determine which ICTs are most effective and for which set of problems.
- b) What is the nature of ‘data’ on projects/initiatives; how does one characterize the quality and credibility of data; and should one make decisions based on data collected to date.
- c) What is the role of ‘vision’ in the success/failure of projects. Do specific projects link to broader vision?
- d) How strategically is ICT being implemented/designed in Africa? (From local institutions vs. from international/donor perspectives)
- e) In what ways do/don’t implementers of ICT projects for the poor ‘respect’/understand the capabilities (skills/literacy/problem-solving, attitudes, values) of the end user and local communities?
- f) How much attention is paid to collective/community involvement as contrasted with individual end-user involvement? How important is this distinction, and how variable is this across projects?
- g) In what ways do ICT program create **negative** outcomes (e.g., excessive expenditures for non-practical purposes; providing window-dressing for policy makers rather than real development consequence; poorly designed purchases; biases toward particular approaches; cycles of throwing good money after back)

- h) Is there a range of pilots that are ‘under the radar’ or maverick projects (concepts, individuals, organizations which are not sanctioned/favored by authorities), have not been explored/evaluated.
- i) How ‘indigenous’ is the ICT ‘sector’ in Africa, and what are its potential consequences?

POSTSCRIPT: PLEASE DO NOT FORGET TO PROVIDE SPECIFIC REFERENCE/URLS TO ANY SPECIFIC DOCUMENTS OR PROJECTS THAT YOU REFER TO ABOVE.

Annex 7: Workshop Report, ITEPA-Ghana (Feb 2003)

Summary Report on the ITEPA - Ghana Workshop

“What Works” in Information Technologies and Education for the Poor in Africa

February 3-4, 2003, Accra
(Report Date: March 17, 2003)

EXECUTIVE SUMMARY

Relatively little evidence-based attention has as yet been paid to the way in which information and communication technologies (ICT) can enhance literacy and livelihood skills of out-of-school youth and adults in sub-Saharan Africa. The ICT and Education for the Poor in Africa (ITEPA) project represents an effort to gather such evidence on what works and what does not work in existing and upcoming efforts to use ICTs with poor populations in South Africa and Ghana, contributing to an improved knowledge base as a platform for enhanced ICT-based educational activities. ITEPA will focus on South Africa and Ghana because NFE is important in both countries, and although the constraints may differ, both are embracing ICT as a way forward.

The Government of Ghana (GoG) and the Ghana Ministry of Education (MoE) recognize the potential of ICT to contribute to development and are keen for its introduction at all levels within the education sector. A draft ‘Information and Communication Technology Policy Framework’ produced by the GoG and MoE, cites the harnessing of information technology as a means to increased basic enrolment, improved learning outcomes in education and increased adult literacy. The ITEPA-Ghana study seeks to understand the current state of practice in the use of ICT among the very poor in Ghana, especially in non-formal education and community development (NFE-CD). Specifically, the study seeks to identify:

- NGOs, GOs, and international agencies that work in are working in NFE-CD that are actually implementing the use of ICT or that seek to do so;
- Current state of ICT activities in FNE-CD, and seek examples that might serve as “Best Practices;”
- Current obstacles and challenges facing ICT utilization in NFE-CD; and
- Opportunities for future directions.

Based upon a case study approach, including a meta-analysis of existing research, the study seeks to undertake background research on what has been achieved and what currently exists in the area of ICT for NFE-CD in South Africa and Ghana.

A Workshop was organized and held on Monday, February 3, 2003 at the Golden Tulip Hotel in Accra, and proceedings from this Workshop are provided below. In addition to the Workshop organizers, 21 participants attended the Workshop (see Appendix for a list of participants.) The Workshop enabled us to identify some key players who are currently engaged in the area of the use of ICT in NFE-CD in Ghana, gather some information about the work that is currently taking place, and learn from their perspectives as well as their practical experiences in the field.

This report summarizes the initial findings from the Workshop, and identifies next steps in the research and analysis process. Ultimately, the ITEPA study will seek to establish a methodological and analytical framework for policy and program setting for effective ICT implementation in NFE-CD. These proceedings and findings will contribute toward a longer report that will synthesize all of the findings established by the ITEPA project, with the possibility of identifying new resources and creating new initiatives to advance the work of ICT for NFE/CD.

WORKSHOP AGENDA

- 12:30 pm – 1:00 pm Luncheon
- 1:00 pm – 1:10 pm Introductions
- 1:10 pm – 1:30 pm The ITEPA Project
- 1:30 pm – 2:20 pm General Discussion
- 2:20 pm – 2:30 pm Break
- 2:30 pm – 3:00 pm Towards Establishing an Analytical Framework
- 3:00 pm – 3:45 pm Breakout Groups for Brainstorming
 - Group A: Access/Infrastructure issues
 - Group B: Content issues
 - Group C: Organizational/Partnership issues
- 3:45 pm – 4:15 pm Post-breakout group discussion
- 4:15 pm – 4:30 pm Wrap up and next steps

GENERAL DISCUSSION

The following is a set of comments culled from the General Discussion period.

1. The term “poor” must be defined with care if we are to use it in the study. Understand that it is a relative term. In defining the “poor,” we should include geographic parameters as well as demographic ones (i.e. urban/rural).
2. There is a need to create an “inventory” of what is already being done in ICT for NFE-CD, including capturing what is happening in the use of “pop” culture in media.
3. University of Winneba’s Distance Learning activities are currently using text/print media, but is planning to move their materials to computer and Internet based operations. They desire to set up CLTC’s and/or collaborate with others for possible dual/multipurpose use.
4. ICT for NFE-CD is crucial for many persons in order to survive in the future.
5. Public policy is not yet responsive to the issue of access, especially in terms of infrastructure (i.e. rural electricity and telephony). What are to be the productive uses of an ICT infrastructure? Policy should then focus on this issue and work toward achieving these productive uses. Ask the questions of why, what, when of outcomes.
6. How can ICT be effectively used to reach the most hard-to-reach communities? How can ICT be effectively used to meet the special education needs persons?
7. The study’s emphasis on co-ordination issues among donor agencies is much appreciated. It is important to work on collaboration to achieve ICT for NFE-CD objectives.
8. It is important to focus on training, especially teacher training, in both FE and NFE. Understand that functional language literacy is the basic building block for ICT for NFE-CD utilization.

9. Local language based content and training may or may not be commercially viable in Ghana, depending on circumstances and target population. English language materials are in great demand. Translation software development may also be a useful solution.
10. We should watch out for focusing too much on just “end user” issues. There is a need to understand that many levels of human capacity are needed. (analogous to: passengers, drivers, mechanics, road engineers)
11. ICT for NFE-CD should include consideration of all forms of ICT and not just computers; currently, functional language literacy education is actively using radio.
12. Make certain hardware components are culturally/linguistically appropriate (e.g. keyboards.)
13. Software in today’s marketplace is not insufficiently sensitive to cultural context (i.e. spell check often fails to respect indigenous languages.) The study’s emphasis on cultural sensitivity is important.

TOWARD AN ANALYTICAL FRAMEWORK

Workshop participants were asked to focus on some specific issues surrounding ICT for NFE-CD. In particular, they were asked to provide their reactions to the following areas:

- Access and Infrastructure (Physical capacity): Physical space; electricity; telephony; hardware and software; ISP; maintenance and support.
- Content and Training (Human capacity): Content solutions; very user-friendly, and culturally sensitive and appropriate solutions; trainer vs. end-user training needs; capacity-building needs for both preparation and delivery of instruction using ICT solutions.
- Organizational Effectiveness, Partnerships, and Collaborations (Organizational capacity): Collaboration between government, private sector, NGOs, and tertiary educational institutions; inter- and intra-agency collaboration; modes of operation and managerial principles; financial and resource sustainability strategies; administrative ICT applications and business processes; data collection.
- Measuring Outcomes (Research capacity): Evaluation of effectiveness of programs; impact of ICT on individual learning and basic skills; impact on educational sector (linkages between NFE and Schooling); impact on improving civil society and democracy; capacity-building needs in order to support a robust research environment.

Through breakout discussion sessions organized around the first three topics, the following represents some of the key ideas mentioned.

1. Access and Infrastructure (Physical capacity)

- Current utility infrastructure is inadequate (i.e. electricity, phone). Also, even portable radio accessibility is difficult due to the high price of batteries.
- Access to content was discussed:
 - There is currently much abuse and unproductive uses of Internet by those who have access. The results are a higher cost of use, inhibiting of bandwidth resulting in low access for productive uses, spreading of viruses, piracy, which then results in access restrictions, increasing the cost of access.

- Existing web resources are mostly commercial; pop-up advertisements are a resource drain.
- There is a desperate need for e-rate policies and practices (Cameroon has already begun this practice.)
- Lack of a technical support industry/infrastructure is an inhibitor to access.
- There is a general lack of awareness of real end-user needs and training issues surrounding them.
- There should be an integrated approach to all forms of ICT and their associated media (radio, CD Rom, DVD, text, and computers.)

2. Content and Training (Human capacity)

- There is a need to develop applications for special needs persons, possibly using pictures and sound.
- Content is needed for life skills. Address issues of attitudes for decisions; critical thinking skills.
- Computer and adult basic literacy content is needed. Teach solid computer skills. Good computer usage tools are needed. Must have materials in translation. Must consider mass education opportunities via ICT. Develop ICT based functional language primers.
- Partnerships are needed in carrying out these activities, for both content development and delivery of content.
- Develop content that is relevant to business development (i.e. for farmer, fisherman). Market research is needed to further understand what demands there may be for this area.
- Content is needed for vocational and youth education.

3. Organizational Effectiveness, Partnerships, and Collaborations (Organizational capacity)

- There is great need for effective coordination, especially given multiple interests of many different and divergent bodies.
- Coordinated activities could include an informational clearinghouse, enabling networking between agencies and sharing of information with each other.
- Reach out to already existing networks and associations to see what they think and feel they need in terms of practical information (i.e. how are certain market prices set for products that are sold on the street, such as the price of vegetables and yams?) These would include professional/trade groups, rural coops, non-formal networks, etc.
- Reach out to the Ghana's chieftaincy system as well as women's groups, healers, and religious institutions.
- Reach out to establish linkages with those in the Diaspora, both in terms of dispersed language groups within the nation (those who have gone from the village to urban centers) as well as with Ghanaians abroad. This could reap substantial economic advantages.
- There is a great need for assistance and training among the local NGOs in resource mobilization and management to increase the effectiveness of ICT for NFE/CD work. (This includes training for developing effective modalities for operating financially self-sustainable CLTCs.)

- In summary, three initiatives were articulated:
 - National level coordinating agency needed, as per above, including addressing policy issues.
 - Tap into existing social, professional/trade/economic, and political networks to identify ways in which ICT can be used to improve their organizational effectiveness.
 - Develop a scheme to mobilize resources, through multiple mechanisms.

OVERALL OBSERVATIONS

Workshop participants expressed their general appreciation for the opportunity to meet to focus on the topic of ICT for NFE-CD. The Workshop drew together a diverse gathering, representing NGOs, GOs, industry, tertiary education, and donor agencies. The modest size of the Workshop allowed for greater interactions among participants, and produced more meaningful dialogue. Participants seemed genuinely interested in focusing greater attention toward ICT for NFE-CD.

NEXT STEPS

A draft of this Summary Report will be circulated to all Workshop participants, with a request for feedback and input toward the final document.

Following up this Workshop, three field visits to CLTCs were made by the ITEPA team in Ghana. In the coming two months a second visit to Ghana by ITEPA representative (Joseph Sun, U. Penn) is anticipated, and further contacts are welcome at that point as a follow up to this Workshop.