Bridges to the Future Initiative South Africa

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1. Project Overview

The Bridges to the Future Initiative (BFI) is a global initiative of the International Literacy Institute (ILI), based at the University of Pennsylvania, working with the Molteno Institute for Language and Literacy (MILL) as the managing agency. The ILI and MILL uses Information and Communication Technologies (ICTs) South Africa and other developing countries for social and economic development, to bridge the "digital divide", by building functional and technological literacy (in SA's 11 national languages), information communities, increasing employment, developing intellectual capital, and in building a local capacity to enhance skills and reduce poverty.

The Government of South Africa is participating, under the leadership of its Department of Higher Education and Training (DHET), as part of a global effort (similar projects are underway in India and Ghana) aimed at using ICTs to help the poorest of the poor. The BFI is one effort to help traverse the rapidly increasing "digital divide", especially among poor people. The BFI is designed to be a major catalyst for efforts to effectively and appropriately harness the benefits of the new information age for educational development among the poorest of the poor.

The Bridges to the Future Initiative in South Africa (BFI-SA) project is contributing to the broader vision by focusing on assisting poor, disadvantaged and marginalised youth and adults in South Africa to take advantage of ICTs to improve their basic literacy and technological literacy skills, as well as information resources that can improve job readiness, health education (including HIV/AIDS prevention), microenterprise, and so forth. This specifically means addressing equity issues with regard to gender, historically disadvantaged groups, and those in rural and under serviced communities.

The Ministry of Higher Education and Training has declared raising literacy levels in South Africa as one of its top priorities, with a goal toward providing youth and adult learners in poor communities with basic literacy, numeracy and lifeskills. 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. In order to implement this joint strategy, the National Department of of Higher Education Training is building a comprehensive delivery model, including relationships with a broad range of organisations in South Africa.

2. Rationale

Estimates today suggest that in South Africa 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 so many have lost their prior ability to read or write. That makes at least 6 million South African adults who are estimated to be either illiterate or 'low literate'.

In this context, the BFI in South Africa is a collaborative initiative, under the leadership of the National DHET and its units in adult education and literacy, and of selected major agencies, that include: Molteno Institute, MultiChoice Africa Foundation, UNISA, and the International Literacy Institute (ILI). Other agencies and institutions such as the Government Communication Information System (GCIS) Multi-Purpose Community Centre (MPCC) project may become involved in the project, depending on their interest and complementarity with the project, as part of the broader stakeholder community.

In developing the BFI-SA, ILI and its partners have worked closely with the S.A. Department of Education (DoE). The DoE has the overall mandate to co-ordinate policies and strategies related to ICT in education. Through a series of meetings in South Africa over the past two years, the DoE has formalised by a Memorandum of Understanding (Appendices) with ILI and Molteno for cooperation in making this initiative a success in South Africa.

Within this context, the BFI-SA is an opportunity to leverage substantial resources from international donor agencies, corporations, foundations and others for the promotion of basic education and literacy, to the benefit of South African development, through the mechanism of this collaborative initiative.

3. Profile of organizations

The BFI-SA is a collaborative initiative planned and conceptualised by the International Literacy Institute (ILI) at the University of Pennsylvania, which signed an MOU with the DHET in December 2002. ILI has established a formal partnership with Molteno Institute, with the expectation that Molteno Institute will serve as the managing agency for BFI-SA.

The International Literacy Institute (ILI) was established by UNESCO and the University of Pennsylvania/Graduate School of Education officially in 1994, and is a major R&D institute on literacy for developing countries. The ILI serves as a stimulus to innovative work on literacy and basic education worldwide, and is also supported by the US federally funded National Centre on Adult Literacy, which has recently been named, with major federal funding, the US *National Technology Laboratory for Adult Education and Literacy*. The ILI organises regional and international conferences, which have included the Southern Africa Regional Literacy Forum in Cape Town in 1994, and the Africa Literacy Forum in Dakar in 1999, both in conjunction with the S.A. Government, UNESCO, World Bank, USAID, and other agencies. The ILI developed the original concept of the BFI, stimulated by the deep problems and huge scale of illiteracy worldwide, along with the growing cost-effectiveness of ICTs. In the BFI, the roles of the ILI are expected to include international partnerships (e.g. fundraising, forums, etc.), worldwide experience and technical assistance in the application of ICTs for literacy and adult basic education, research and evaluation methodologies, and the highly regarded ICT expertise of the University of Pennsylvania's School of Engineering and Applied Sciences.

Molteno Institute was established by Rhodes University in the Eastern Cape Province in 1974, and is widely known in South Africa, and indeed in the world, as one of the premier agencies capable of working with a diverse array of partners to provide literacy and now the ICT infrastructure in the primary schools in some of the most disadvantaged areas of South Africa and the African Continent. Its operational and technical competencies have been a model for work across Africa. Molteno Institute (MILL) has also developed a framework for educator development in using information and communication technologies (ICTs) to

support their classroom practice. Molteno has agreed to offer this same expertise to the establishment of CLTCs within the BFI, to serve as the administrative leader (serving as coordinator and fiscal agency), to utilize its installed infrastructural base for expansion to out-of-school youth and adult literacy work, and mobilize its national educators' network of specialists to work toward achieving.

4. Vision

BFI-SA is expected to bring the benefits of ICT for learning and development within practical reach of non-literate, low-literate, unschooled and/or poorly schooled out-of-school youth and adults in SA. In this way, it is expected that the quality of adult basic education provision in the non-formal sector, as well the interest and capabilities of individuals to and take advantage of basic skills will grow and impact social and economic development in South Africa. BFI-SA will also inform the policy development processes on the use of ICT in adult education and literacy as part of a research and evaluation process that will be implemented to track the impact of the BFI-SA programme on individuals and at the implementation level.

5. Objectives

The main objectives of the BFI-SA are to create and implement:

1. Community learning and technology centres (CLTCs) for lifelong learning and income-generation, open to the poorest community members who need literacy and basic skills; these 'dual use' CLTCs are located initially within computer labs located in primary schools, MPCCs and other locations, often during additional hours (after school hours and on weekends) when there is greater availability of ICT resources. Content in the CLTCs would incorporate both ICT-based learning methodologies for enhancing basic literacy skills, as well as information resources that will have high social impact; where appropriate, software content have been developed in SA national and regional languages.

2. Develop tools to improve basic education and literacy through teacher training in selected countries; such tools are both CD-ROM and/or Internet based, and provide an important way to enhance the quality and motivation of teachers in the non-formal sector; and

3. Develop specialized ICT-supported tools for improving the quality of human development in health, agriculture, HIV/AIDS prevention, etc. The BFI-SA envisions that poor people have needs that go well beyond those of 'simply more education and skills', that indeed their interests are variable but related to improving their lives in many ways. BFI-SA will be sensitive to these specialized and culturally-sensitive needs of poor people. In addition, with support of ICT advanced tool developers, the BFI-SA expects to be able to offer low-cost, environmentally appropriate tools for use in normally difficult-to-reach areas of South Africa.

Throughout these objectives, the BFI utilizes ICT's as "enablers" both to deliver resources and to monitor progress and effectiveness of the results.

6. Beneficiaries

6.1 Individuals

Ultimately, the individual needs are the prime beneficiary of an educational and social programme. In this case, by targeting out-of-school youth and adults who have had little or no education, the individuals by the BFI-SA are those within the poorest sectors of S.A. society, those who have been excluded from decent quality education, those who live in rural areas, those who do not speak English or Afrikaans as a mother tongue, those afflicted by poverty and disease, and those who have been historically disadvantaged/marginalized by gender, ethnicity and race. Illiteracy and low literacy are more prevalent amongst these groups than among any other groups in today's South Africa. While some aspects of the BFI provides services directly to such individuals (through the CLTCs described above), the project also seeks to strengthen the ability of both instructors and programmes that provide services to these same people.

6.2 Instructors

Instructors, whether paid teachers or volunteers are the vital link between the wishes of policy makers and the needs of the people to be served. Without qualified, trained, and motivated instructors, effective services can not be adequately delivered. And yet, all stakeholders realize that while there do exist outstanding instructors who labour under difficult circumstances for little in the way of remuneration, there are many more who quit after only a few weeks or months, or who remain in a system where they become disillusioned and unmotivated, sometimes to the point where they even fail to show up for their own classes. This is not unique to South Africa, of course, as it is an endemic situation described in many global reports, such as in the EFA Dakar report on *Literacy and Adult Education* (UNESCO/ILI, 2000). Thus, the BFI-SA project has as a key objective to develop tools for instructors that will not only supplement and make easier their instructional duties, but will also motivate them by their own self-improvement

7. Design of BFI-SA

There are three distinct components of the BFI-SA, as described below:
- Community Learning and Technology Centres
- Improving Teacher Training
- Innovative ICT Applications for Human Development, Life Long Learning and Sustainability

7.1 Community Learning and Technology Centres

In the first component of the project, the BFI-SA will bring a focus on the individual end-user (community member) at the provincial and local level. The basic concept is the creation of Community Learning and Technology Centres (CLTCs), each of which will contain ICT-enabled distance learning resources designed especially for neo-literate, low-literate and disadvantaged families, complex components of which will eventually be available in all of South Africa's 11 official languages. The CLTCs typically consist of a networked lab of 15-20 PCs, with Internet capability (where possible) and web-based tools for providing information, knowledge and resources, as well as CD-ROM drive (essential where internet connectivity is not available). In addition, and critical to success, is the availability of master teacher (MT) facilitators (see further description in Component 2, below) who are trained to

staff the CLTCs in their area. Finally, CLTCs are provided with 'stand alone' materials (CD-ROMs and printed materials) that will also support learning, especially when and if a CLTC cannot connect with the Internet.

It is expected that many (nearly two-thirds) of BFI-SA CLTCs will be located in existing ICT-enabled locations, such as secondary schools, community Multi Purpose Community Centers (MPCCs), MultiChoice Africa Foundation centres, UNISA learning centres, and other locations in selected disadvantaged areas. About one-third of the CLTCs are contributed as part of the BFI-SA budget plan, and serve as "models" for the best of what BFI-SA can offer. When adapted from existing secondary schools (such as those linked to SNSA), CLTCs will receive BFI-supported ICT equipment (if required) as well as at least one MT as facilitator on a part-time basis to cover a set number of CLTCs for training and monitoring purposes.

Participating CLTC schools/sites provide basic physical infrastructure (buildings, electricity, phone and Internet connections [possibly subsidized], maintenance, and security). After school hours, ABET, or NGO agencies will provide facilitator/instructors who will stay after hours to keep the CLTC open for community use (and access to a minimum of 75% of the PCs). Individual access and scheduling of access to the CLTC PCs will be determined by the CLTC management in cooperation with the community and local district officials in the area of the CLTC secondary school, and possibly based on a system of hours/family usage (e.g., each family in the area has the right to sign up for 2 hours per week on a non-fee basis, and more time on a user-fee basis (thereby enhancing sustainability); the usage issue will be determined by district education committees). Support for the maintenance of the PC labs and connectivity may be provided by BFI-SA budget for a limited amount of time (i.e., one or more years), but the CLTC is expected to be sustained by the school and community in the longer term, whose principal motivation is expected to be the maintenance of the computer lab for secondary school students during school hours. Further support could be acquired from UNISA Computer Science students in the area of the CLTC. World-Links, an international NGO with significant experience in this realm, may provide expertise in the implementation of the CLTCs in secondary schools as part of its on-going collaboration with SNSA.

The two broad objectives of the CLTCs are:

- Access to instruction in basic skills, technological literacy, basic vocational skills and other ICT-based competencies on PCs, with Internet capability (where feasible). Community access will be provided to: those youth and adults who have completed basic education courses with basic education instructors (BEIs; see further description, below) within ABET, as well as to any community individuals with a need for such access. The main goal is to increase life options for poor people. More specifically, this might include providing opportunities for youths to gain additional basic skills to re-enter the formal school system, or adults to change their job opportunities as a function of ICT or basic vocational skills acquired. Each centre will need a customized business plan to suit their surrounding environment. If demand is high for access, then the community will need to develop a prioritisation system, along with the possibility of a user-fee system for those individuals who wish 'extra hours' and have the resources to pay.

- Access to high impact information resources will be provided in user-friendly (local language, easy format, easy user-interface) format where Internet is available. Other ICT-based resources (e.g., CD-ROMs, cassettes, videotapes) also will be made available, especially where Internet access is poor or absent. In terms of the instructional content for lifelong learning, CLTCs are expected to provide high-use information resources in

sectors such as agriculture, health (e.g. HIV/AIDS), micro-enterprise and so forth. Where there are other agencies already providing some of these services (e.g. NGOs, other government agencies), BFI will seek to partner with them in order to reduce cost and increase efficiency.

There are distinct cost and technical issues related to the use of existing platforms and the deployment and configuration of new CLTCs, explored in further detail below.

7.2 Improving Teacher Training

According to S.A. government statistics there are approximately 3 million South Africans who have never been to school, and millions more who are "semi-literate" due to poor schooling and/or early school leaving. Multiple varieties of non-formal education (NFE), adult basic education and literacy programs for out-of-school children, youth and adults exist in today's South Africa, but these provide today less than a quarter of the total need for further education services in South Africa. Few of the teachers in NFE, alternative, second-chance schools and programs, and continuing education centres have ever received substantive in-service teacher training, and only a minimum of pre-service training. Worldwide research and evaluation has demonstrated that teacher quality (via teacher training) is one of the most critical factors in improving learning achievement and learner retention in youth and adult literacy programs, and that ICT tools for teacher training is one of the most cost-effective uses of technology for educational development.

Thus, the main objectives of the BFI teacher training program (Component 2) include providing improved teaching quality through multimedia instructional design, better awareness of quality learning, and significantly enhanced literacy and basic education provision. A second goal will be to help transfer ICT knowledge, access, and use among teachers, so that these newly-trained teachers will be able to serve as intermediaries and tutors in the CLTCs which will form the basis of Component 1 of the BFI-SA. Overall, the improvement of the quality of teacher training in this sector will be a vital step to help youths and adults in improving basic literacy and technological literacy skills as a means to participate in the changing civil, social, and economic life of the new South Africa.

Through its work on ICT-based teacher education, as detailed elsewhere, the ILI can be of significant help to the BFI collaboration, especially through provision of expertise around its recently released *Professional Development Kit* (PDK) for Adult Education.

7.3 Innovative ICT Applications

Component 3 of BFI, beginning in project year 2, will utilize the latest developments in ICT to connect the 'last mile' participants (those most difficult to reach) to information resources. Dramatic changes in connectivity and portability are already beginning to appear, with the rapid availability cellular connections and handheld devices that can bypass the obsolete hardwire communication systems and various high-maintenance devices (such as PCs). One can also anticipate the use of intelligent systems (including voice activation and cultural/linguistic pre-configuration) that will improve the user-customization of ICT-based resources.

Based on developments currently taking place, one might further anticipate the use of community-based newsletters and information services that will filter relevant information from documents and Web pages and sort them for different types of community and linguistic needs, greatly simplifying and focusing information retrieval. These might be printed out on a

local basis, using low-cost techniques that are only now becoming possible in local languages.

The most important element of this component is the capacity of the BFI-SA to take advantage of emerging ICTs – through private sector partnerships – and put them to advantage in South Africa much earlier than the "trickle down" or "second hand" approaches that are currently the standard (where the well-to-do communities usually obtain such services long before the poor and disadvantaged). Up to the present, ICTs were often thought to be too expensive or not 'appropriate' for use with less well-educated people; in contrast, the BFI-SA takes the perspective that these barriers will likely fall, especially if basic skills instructional design is embedded in ICT access.

Component 3 will move information access out of a strictly education-only sphere, and more in the direction of human development, vocational improvement, and lifelong learning; and itwill likely focus on a more broad-based approach to such issues as health and disease prevention (e.g. HIV/AIDS), agricultural extension, population planning, micro finance, entrepreneurship, and childcare. In these areas, time-sensitive, accurate and context-rich information can make a significant difference in family decision making and planning. As such, the CLTCs will become known as places where timely and important information resources can be obtained, rather than as a purely 'education program' centres.

Component 3 will also signal a focus on the sustainability aspect of the project. In other words, the BFI-SA project elements (especially the CLTCs) will need to become largely self-sustaining in terms of funding and full local leadership and development.

7.4 Software Development and Implementation

The multimedia development has been a partnership effort. In terms of the technological component, we have developed the e-learning activity templates that allow for rapid prototyping. Core aspects of the BFI approach include: language choice, extreme user-friendly interfaces, visual style, and the cultural relevance of all dialogue.
The following are some prominent features of the BFI e-learning solution:

o Audio guidance throughout.
o A language choice function, offering four languages: English, Sepedi, Xitsonga, Tshivenda. All the remaining official languages will be covered in the next 18 months.
o A Login functionality, for purposes of learner progress tracking.
o An introductory tutorial that teaches the learners basic computer literacy, so that they acquire all the skills needed to successfully utilize the e-learning solution.
o A user-friendly menu system.
o 30 lessons on ABET level 1 (as of January 2010). Each lesson consists of an introductory animation followed by five to seven different activities.
o A learner's progress is tracked throughout the solution on a USB stick. This information can be gathered to give accurate feedback on the usage of the solution, including the following data:
  ▪ Time spent per activity, excluding time that activity was paused
  ▪ Total time per activity, including time that activity was paused
  ▪ Number of mistakes per activity
  ▪ Total time spent per lesson
  ▪ Number of times each activity completed
  ▪ Time till correct answer

▪ Time till failure

7.5 *Multimedia Training Tools*

The BFI utilizes innovative ICT multimedia techniques to increase the quality of teacher training, the skills of the teachers, and the relevance of teachers' knowledge for enhancing the motivation and learning in students. While some interesting and important methodologies exist worldwide, it is expected that new digital solutions will be required in South Africa in order to train teachers in all 11 of its national languages, and with cultural content that will be relevant to culturally diverse learners in disadvantaged communities.

Many of these methodologies are based on the substantive work of the BFI-SA partners with schoolteachers and adult educators over recent years. Others may be based on multimedia methodologies for capturing local video and audio content, innovative and culture-specific content for teacher training, which will be designed and produced locally (with technical assistance from the ILI). The ILI's *International Literacy Explorer, Professional Development Kit for Adult Educators,* and related products will serve as models that will incorporate training, documents (digital video and audio, text documents, resources and information database) designed especially for each participating region. In addition, the BFI-SA will take advantage of the ICT based education work currently being undertaken in South Africa, such as: ICT-based platforms and educator methodologies in secondary schools by SNSA, distance education and new pedagogy development by UNISA, and multimedia development for educators by MCAF.

Further, the ILI has also developed techniques for digital videography in instructional design and software development. Specific content is developed from case studies of exemplary education programs in local contexts, including interviews with teachers, class sessions in progress, and interviews with other teachers, specialists and learners to capture their perspectives on the learning process. Using digital editing software, the video material is reviewed and logged such that topics and issues can be identified and categorized as they relate to nationally- and locally-determined needs assessment. MCAF, ILI and UNISA will collaborate closely on this aspect of ICT-based learning material development.

BFI-SA product design will also provide tools to allow teachers to both create and exchange teaching materials and collaborate within web-based communities. It will, in addition, enable the pilot testing of systems, on-going evaluation of effectiveness, and outcome assessment of learning. A major goal will be to produce local language resources in all South African languages of each of the regions where work will be undertaken. Decisions will be made, during component 2, as to how much of the product material should be CD-ROM based, and how much available on the web, or both.

A representative number of teacher trainees will be selected from literacy programs sponsored by government and non-governmental agencies, and continuing education centres, with selection according to following criteria:
- Voluntary interest in improved teaching
- Openness towards technology
- Priority given to women
- Residence availability during training program
- Well respected in the local community