

CREATING ICT AWARENESS, LITERACY AND EXPERTISE

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Abstract

Promotion of ICT awareness, literacy and expertise is a major challenge to universities, private companies and governments alike. Successful ICT evangelization requires more emphasis on awareness, literacy and expertise, treating it with the same level of importance as investment in basic infrastructure, tools, equipment and materials. Existing educational structures should be utilized to prepare the African public psychologically, economically and technically deal with the seemingly alien ICT. African universities, just like their European and Asian counterparts must identify the literacy needs and help to strengthen human and institutional capacities, develop and suggest meaningful technologies.

In this paper, an attempt is made to analyse literacy needs in different universities in Africa and provide different best practices that strive to meet these needs. Most suggested practices/strategies have reaped significant results in Asia and may be directly adapted by African universities/governments bearing cultural and religious beliefs in mind.

Keywords: *African universities; ICT Literacy needs; creating awareness literacy and expertise; strategies and practices.*

1. Introduction

In Africa, the digital divide is manifested in at least three basic forms: lack of access; high cost of service; and low quality of service. The extent of any of the three is a reflection of the level of awareness, literacy and expertise. Lack of awareness often leads to lack of access, and where access is available, lack of literacy and expertise yields poor utilization and sometimes misuse.

Despite the power of ICT, most African communities, especially the rural poor, still perceive ICT as a mere form of westernisation. If affordable, proper awareness will advance the position of modern ICT on the scale of preference. Improved literacy enhances proper usage of ICT services, while high expertise guarantees realistic choices and sustainability.

2. Literacy needs analysis and suggested strategies

2.1 Need to keep up with emerging technology and ratify sharing of research

Due to a multiplicity of reasons, African universities tend to limp behind the latest technology. Such universities should be avid towards ICT developments and selectively adapt to technology that is apposite. It is thus important for universities to ratify sharing of research material, promptly revise their syllabi and collaborate with ICT practitioners/developers. In Andhra Pradesh (AP)-India, the leading state in ICT, the syllabus for all public universities is reviewed at least every two years.

Most African universities require Masters and PhD students as well as academics to do some form of research. It is common practice for African universities to keep these research materials in hard copy format under lock and key. These materials should be made available to any interested party with the intent to further or implement the research. In Thailand, there is an on-going attempt to convert the research work from all universities/higher institutions into soft copy format and provide a web-enabled "digital library". The bottom line is to provide an easily accessible centralized resource centre that will allow scholars to implement, extend or refine existing research work.

Another existing example is the centralized web-enabled research resource [1], a collection of all papers published on science related work.

Open courseware (OCW) is another initiative taken by the MIT (Massachusetts Institute of Technology). It is a free and open educational resource for faculty, students, and self-learners around the world. “OCW supports MIT’s mission to advance knowledge and education, and serve the world in the 21st century” [2]. In this attempt, all lecture materials including assignments for all the courses offered by MIT are freely available on the internet. Today, 500 courses from MIT instructors are available online to students, parents, teachers, alumni...anyone with Internet access and a desire to know more about science, technology and culture. In the next four years, approximately 2000 MIT courses will be published online [8].

Initial evaluation shows that the response from faculty, alumni and the public has been very positive and the project has not only promoted the work of MIT faculty, but it has helped foster new collaborations with other educators working in their fields around the world. According to the OCW team, 65% of the traffic using OPEN COURSEWARE is international [8].

2.2 Need to confront the challenge of technology cost using “open source”

African universities must learn to live with the chronic under funding from government. It is time for the African universities to have a realistic choice of technologies that are financially sustainable and efficient. In Africa, in Asia and in much of the world open source is looking like the best way to usher in the information age. Money, flexibility and independence from monopoly are a powerful combination. Open-source, among other advantages, relieves users from expensive licensing and proprietary taxes to vendors of proprietary software.

With open source software — sometimes called “free software” — the source code, or programming instructions, is open for free downloading, inspection and modification by anyone. The GNU/Linux (GPL) operating system is the best known project in the genre, but much of the core software used in the internet today is also open source. Open source software – “free software” is not really free. The license allows the software to be distributed only at the cost of the distribution. A fully functional Copy of Linux can be obtained at a cost of US\$2 including the cost of shipping. At the moment, it is possible to deploy any production system exclusively based on open-source. Outstanding products are listed in table 2.1 below.

Table 2.1: Some of the major “open source” software.

Software Task	Open source software
Operating System	Linux
Web Browser	Mozilla
Database	mySql
Web Server	Apache

The objective of open source is not to shun proprietary software if the price is right and can do the task. Though the main argument of proprietary vendors has been security, security through obscurity is not the best solution and in fact open source based software has proved to be more secure than most proprietary counterparts.

Free software reduces the total cost of ICT ownership making it accessible by universities for

training, government departments and domestic deployment. This allows universities to actively participate in confronting the challenges of technology costs. Here, open source is seen as the ultimate solution in subsidising university operational costs as well as a future undisputed choice that should be advocated for deployment in government departments, Non Governmental Organizations (NGOs), and domestic use. In India, most brand new PCs are loaded with Linux, especially new Compaq systems, and all government departments are in the process of rolling over to appropriate Open Source alternatives.

2.3 Need to localize ICT

The majority of the rural dwellers, who need intensive ICT awareness and literacy, cannot satisfactorily comprehend foreign languages. Most content on the internet as well as common software packages are all in languages foreign to Africa. There is need for African communities to locally adapt content and contextualise it. ICT must therefore be blended, branded and suitably customized for its target population to avoid the tendency of some people dismissing it as a mere form of westernisation. For instance, ICT is more appealing if it speaks the same language as the rural people.

In India, Thailand and the rest of Asia, with the help of universities, several software packages have been translated to appropriate local languages and writings while Automatic Teller Machines (ATMs) can speak local languages. Unlike Asia where most communities use local characters in writing, most African countries already use the English alphabet making it easier to transcribe.

In South Africa, Mozilla Web browser has been translated into Xhosa, Zulu and four other languages while in Tanzania, there is an ongoing attempt by the University of Dar es Salaam University to localize Linux into Swahili. In a bid to reach a larger population, there is an ongoing attempt in India to translate the Windows front-end into Hindi. Hindi based keyboards are already available and Hindi cell phone handsets are also available.

Universities, in collaboration with other organizations, have been influential in most of these projects and African universities should not be isolated cases. Indeed, a lot of this work can be assigned to students as projects at both Masters and undergraduate level.

2.4 Need to reduce cost of learning materials

In Africa, attaining university education is cost prohibitive for the majority of the population. The acute shortage and high costs of instruction material tend to retard academic excellence. The emergence of the internet has partially eased the problem, but the overwhelming majority in Africa lack access to the internet, the know-how to use, and the information literacy to exploit it. A classic initiative taken by the East Asian Governments (India, Bangladesh, Pakistan, Nepal, Sri Lanka and the Maldives) is an agreement with leading European book publishers to make Low Priced Editions (LPE) of standard university books and reference Material of foreign origin available to the Indian university students. The concerned Ministries have been operating three programmes in collaboration with the Governments of the UK (English Language Book Society Series, since 1960), the USA (Joint Indo-American Standard Works Programme, since 1961) and the USSR (Joint Indo- Soviet Textbook Programme, since 1965). Latest editions of books are considered for coverage under these programmes and are assessed by expert agencies from the standpoint of their suitability for Indian students and non-availability of comparable books by Indian authors. So far, 715 British, 1620 American and 430 Soviet books have been published under this programme [3]. The publishers allow university and secondary books to be locally reprinted using less graphics, cheap paper and low ink quality. Such books are usually marked with the statement "This edition is manufactured in India and is authorized for sale only in India, Bangladesh, Pakistan, Nepal, Sri Lanka and the Maldives". These low price editions (LPE) are usually 20% to 40% of the original price. A comparison of prices of some books in ICT is summarized in Table 4.1 on the next page.

Table 4.1: Showing sample reduction in price of LPE editions. Data extracted from [4] and [5]. The exchange rate assumed is 1\$=45Rs

Book Title	Original Price (\$)	LPE Price (\$)	% Reduction
Information Technology for Management: Transforming Organizations in the Digital Economy	109.95	16.25	85.2
Technology Paradise Lost: Why Companies Will Spend Less to Get More from Information Technology	16.97	2.00	88.2
Advanced data warehouse multidimensional modelling with db2 olap server	48.00	4.00	91.7
“Interconnecting Cisco Networks” by Cisco Press costs	50.00	10.00	80.0

There is also an established programme for exchange of second-hand books by book dealers. Second-hand books are usually exchanged at 60% of the original price and resold at 20% less of the original price. In addition there is government support for associations of local publishers and authors.

2.5 Need to provide multiple levels of expertise

There is persistent lack of multi-level skills of expertise. Most African universities and education systems have their history in colonial days and continue to keep the faith of the colonizers. The sole aim of universities has been to produce experts only at the highest level. Whereas nobody should alter the main objective of the university to produce highly skilled human resource, we must devise mechanisms to give different levels of training that suit different interest groups. Groups such as Middle Level Managers (MLMs), High Level Managers (HLMs), Chief Executive Officers (CEOs), and typical end users do not need all the technical details involved in most of the university programmes.

Universities may rely on other tertiary institutes to provide the other levels of skill base only if the claimed level of expertise is adequately administered by these institutes.

Universities should provide communities with versatile ICT skills, ranging from short courses for end users to traditional university degree courses. Such courses provide an opening for interested parties who can no longer fit in the main stream education system and will compliment university ICT graduates who are adept in high technology that is rarely directly applicable to the poor who need ICT most. This kind of diversification has proved productive for software/hardware vendors such as CISCO, ORACLE, REDHAT, MICROSOFT, which provide the public with various levels of non-professional and professional training and certification.

2.6 Need to use exhibitions and conferences to reach the public

Unlike universities in India, African universities seldom interact with the public and their work is little known to the community. African universities should thus devise mechanisms of reaching the public in order to be seen as “partners in development”. Strategies adapted by Asian governments include use of the media through magazines, exhibitions, conferences and ambitious promotion activities.

Through exhibitions, universities can interact with the public and showcase the latest trends and developments in the field of information technologies. For instance the “ICT INDIA 2002” in Mumbai- India exhibition attracted about 350 companies, the 2002 “Akanksa” IT conference at Osmania University - Hyderabad (INDIA) attracted leading companies in IT. The conference was organized by the University College of Science (UCS) with a major objective of bringing together leading ICT institutions as well as practitioners. Not only do exhibitions give a roaring go to the ICT, but they also allow the community to compare different vendors, get free demonstrations, and sometimes acquire ICT equipment at subsidized prices.

“Live demos” and “live projects” is another initiative common in Indian institutions to provide a glimpse of what technology can offer and cannot offer. In live demos, students are given a live demonstration of what they will be able to do after taking the course while the rest are given demonstration of what can be achieved with the technology. In live projects any interested individual is incorporated into a fully functional project for study or experience purposes.

Another example worth mentioning in this context is the ambitious “ISETT SETA TECHNOLOGY MOBILE” (Information Systems, Electronics and Telephone Technology-Sector Education and Training Authority) and “ISETT” (Information Systems, Electronics and Telephone Technology) in South Africa. It is a specially commissioned “technology mobile” that takes information services, electronics and telecommunications technologies to learners and the public. The major objective is to promote ICT, electronics and telecommunications as career fields for learners, by providing online careers information and by elucidating the underlying science and mathematics principles of telecom networks and other technologies.

The entire set-up is mounted on an ordinary vehicle (bus) and communicates to the outside world through 4 satellite access points. The Education Training Authority (ETA) is heavily involved in the project that has been running since October 2002. The bus has been to various places in the country and it provides demonstrations and training. More information on the ISETT SETA project can be obtained from [6], [7].

2.7 Need to use ICT to directly benefit the public

To further the case for interest of ICT to the public, several Indian universities have opted to use ICT to directly benefit the public. Besides the absolute need to use ICT in solving the basic rural problems of food security, safe water and sanitation and healthcare, African universities need to harvest the power of ICT first. Possible areas include digitisation of libraries, e-learning and enabling all transactions online.

The eSeva project is the latest hit in the line of bringing the benefits of ICT to the Indian public. The Andhra Pradesh government launched [eSeva](#), with the aim of providing “one stop non stop service” to the citizens. It is, perhaps, one of the most ambitious projects in India, in the realm of government-to-citizen (G2C) services. It is currently operational through 29 eSeva centres (with 280 service counters) spread over the Twin Cities of Hyderabad and Secenderabad, and Ranga Reddy District. eSeva offers a wide spectrum of services ranging from Payment of Utilities Bills, Certificates, Permits / Licences, Transport Department Services to Reservation, Passport Applications and Downloading of Forms. The government is planning to extend the eSeva project up to villages in a phased manner.

2.8 Need to catalyse government policy

Governments rarely work effectively without pressure groups. For developing countries, the significance of ICT is less known to the public. Universities, on behalf of the public, must remind the government to develop policies that create a conducive environment for ICT. Proper policies attract investors and give boost to economic growth. Market forces alone cannot bring the service to rural areas because they are not as profitable as urban ones. Moreover, other factors such as unreliability of power, and poor telecommunication connectivity have led to frustration in service and decrease in use of ICT services in those areas.

3. Conclusion

ICT can be made contagious through a collective effort of private-public partnerships, with universities and governments not abdicating their duties. The above approach has reaped positive results in bridging the digital divide to an extent that countries such as Japan, India, China, Korea and Thailand have either overtaken or are at the verge of overtaking the traditional European leaders in ICT. If the introduction of ICT truly is not about the technology but about the community, then there needs to be more work done to raise awareness about what ICT can offer, and at the same time prepare the community support for initiatives and the process of change management that follows.

Human resource and personnel development must be carried out on a consistent/continual basis, at all levels of education: formal, non-formal, and voluntary education system.

However, the above will be a reality only if ICT is seen to be part of the solution to the basic problems by promoting the intelligent use of information technology in African communities. Accordingly, the universities in Africa are stakeholders in solving/minimizing some of these queries and must therefore take a "Leading Role in ICT-enabled Human Development".

4. References

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