
Dirt road or yellow brick superhighway? Information and communication technology in academic libraries of South Africa

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Abstract

Information and communication technology (ICT) development in South African libraries cannot be understood outside the context of the post-apartheid period. The society consists of a technologically sophisticated sector, and an underdeveloped Third World sector. Higher education and other libraries attempt to straddle this divide. Government policy emphasises the importance of connectivity in redressing inequality. Policy is a contested area, and investigations have been conducted with little concrete result. The main development has been the emergence of academic library consortia, which have succeeded in attracting funding from the USA and other foundations. But without information literacy, these developments will have little impact. There are grounds for techno-pessimism, as digital information resources are seen by advanced countries as commodities for which payment must be made, even if knowledge production originally took place in the South.

Introduction

Any discussion of information and communication technology (ICT) developments in South Africa has to acknowledge that its economic and social history has created a divided and confused community. In some respects, the country has characteristics of a “first-world” culture, with a highly literate group of its population making use of a comprehensive system of telecommunications, information and consumer services. It has, also, a high proportion of its population that is barely literate, with rates of literacy varying from between 52 percent in metropolitan areas to 28 percent in rural areas. The difference in literacy levels across the population groups is also large. Urban areas have a higher percentage of inhabitants who are matriculate in the schools, but, again, the spread across population groups is very marked (South Africa, Ministry for Welfare and Population Development, 1998, p. 16). The development of the “information society” seems to offer a way to uplift a large segment of the population of South Africa: however, the design and implementation of appropriate and sustainable systems of ICT are problematic within such a damaged culture (Underwood and Nassimbeni, 1998).

Interim results from the first post-apartheid census conducted in 1996 showed that there are 37.9 million people living in South Africa. The country is classified as an upper-middle income country of medium level human development, but a different reality is revealed in the 1996 World Competitiveness Report which placed South Africa 44th out of 46 countries and 46th in the human development category (*Weekly Mail and Guardian*, 1997). The World Development Report showed that, although South Africa is the country in Africa closest to the developed world, the gap between rich and poor is one of the largest in the world, a legacy of the skewed provision of resources under the apartheid government (*Financial Mail*, 1997). The Human Development Index level of development of the country’s population based on life expectancy, education and income was 0.716 in 1994 (South Africa, Ministry for Welfare and Population Development, 1998, p. 10). Disaggregation of the figures shows the vast discrepancies in quality of life for different sectors of the society, as the Human Development Index

figures based on the population groupings defined by the former apartheid state demonstrate (see Table I). Although non-racialism is enshrined in the new Constitution, because of the imperative for redress, it is sometimes necessary to refer to the former categorisation of people according to "population group".

There are also vast differences between provinces, so that the Human Development Index figure for the Northern Province, the poorest province, is 0.470, while the figure for the Western Cape, the richest, is 0.826.

A complicating factor for the design and implementation of any ICT system in South Africa is the diversity of languages used by its inhabitants. Eleven "official" languages are recognised, consisting of nine African languages, English and Afrikaans. Usage patterns vary within and between regions. It would be unsafe to assume that any one language could be regarded as a *lingua franca* or preferred language for teaching and learning purposes. A recent sample survey (Sayed, 1998, p. 31) of students in the five higher-education institutions of the Western Cape indicated, for example, that the distribution of home language was quite wide and that there were considerable disparities between the institutions (see Table II).

Table I Human development index for population groups in South Africa in 1994

Population group	Human development index
Africans	0.500
Coloureds	0.663
Asians	0.836
Whites	0.897

Table II Home language preferences of a sample of students at higher education institutions of the Western Cape

	African		Other	
	Afrikaans (%)	English (%)	languages (%)	languages (%)
Peninsula Technikon	33.1	18.6	47.7	0.6
Cape Technikon	37.8	42.5	17.9	1.8
University of the Western Cape	19.8	27.7	52.0	0.5
University of Stellenbosch	66.5	30.5	1.6	1.4
University of Cape Town	4.2	67.0	23.0	5.8
Overall	32.3	37.3	28.4	2.0

Connectivity

Connectivity is an essential component of the development of an information society in Africa: a year-by-year comparison of connectivity published in map form (Landweber, 1993-1997) shows the gradual spread of the Internet across Africa. However, this apparent spread of connectivity masks startling differences in provision, with South Africa being considerably ahead of other African countries. A survey of the number of Internet hosts placed it as 20th in world ranking in July 1998 but within the African continent it ranks as first, with approximately 96 percent of Africa's hosts. Something of the scale of the disparity can be appreciated by noting that Egypt occupies second position in Africa, with some 1.6 percent of the hosts in the continent (Network Wizards, 1998). The concept of a "global village" is presently unrealistic in Africa and even within South Africa represents a major technological and social challenge. Access to telecommunications within South Africa is uneven, reflecting the gross inequities inherited from the apartheid state. Although clear commitments to massive expansion of the telecommunications infrastructure have been given in addresses by government ministers, such changes will take a considerable time to have a large-scale effect, although it is apparent that cellular communications technology is already gaining a strong position and may offer a more attractive development path than fixed-wire communications technologies.

Library and information services in South Africa: a profile

The library and information sector is characterised by pockets of excellence, and relative technological sophistication, while the majority of citizens "do not have access to even the most rudimentary library and information services" (South Africa, Arts and Culture Task Group, Library and Information Services Subcommittee, 1995, p. 10). South Africa's library and information services include two national libraries, 670 public (municipal) libraries, 370 special libraries, 90 government libraries, and 88 university and college libraries. The national

bookstock is estimated to consist of 47 million items and there are 1,570 service points (Lor, 1995). The development has been haphazard and uncoordinated because the apartheid-state government abrogated its responsibilities for the provision of library and information services, which it declared would develop adequately in response to market forces (South Africa, Arts and Culture Task Group, Library and Information Services Subcommittee, 1995, p. 10). Progressive information workers adopted vigorous protest and lobby actions against the approaches to the conceptualisation and practice of library and information work informed by rigidity, conservatism, alignment with – and even subservience to – government policies of the period. When it became evident that liberation was imminent, these efforts coalesced into concerted initiatives, in the early 1990s, to start a process of restructuring and transformation in library and information services.

Progress has depended on establishing a set of “blueprints” which define possible courses of action and identify the resource implications and consequences of each. This process developed according to an agenda which espoused the principles of non-racism, non-sexism and redress, promoted by the liberation movement and which began to move from the mode of critique and opposition to one of engagement with the development of policy options for the new state. A start was made with the National Education Policy Investigation (NEPI), which included a study of library and information services (National Education Co-ordinating Committee, National Education Policy Investigation, 1992). Stadler (1992) notes: “NEPI is based on five fundamental principles by which each section of research is measured. These are the principles of non-racism, non-sexism, democracy, the redress of past disparities in education, and equality. These principles apply both to the research content and the process of research.”

The report of the Interministerial Working Group on the library and information services (LIS) function advised the government on mechanisms to ensure good governance of the library and information system at the national level in South Africa, and to facilitate maximum availability and use of all relevant information sources to advance the now-abandoned

reconstruction and development programme. In relation to ICT it recommended that LIS policy should not be approached in isolation from the general national information society policy; rather, the role of LIS in the broader information society policy should be stressed (South Africa, Interministerial Working Group on the Library and Information Services Function (National Level), 1996, Executive summary).

The themes of the information society and the need to enhance the skills of the populace of South Africa resonate in the National Commission on Higher Education Working Group on Libraries and Information Technology (WGLIT) report which considered policy implications of the role of libraries and information technology in higher education (National Commission on Higher Education, Working Group on Libraries and Information Technology, 1996). The complementary and interweaving roles of IT and libraries in relation to the development of the national information society policy were explicitly recognised. The WGLIT investigation was framed by a vision of a new national information system capable of integrating its component parts into a seamless whole, rather than one in which individuality is highlighted, and of a transformed higher education system responsive to both the national agenda of reconstruction, and also the demands of globalisation and the new knowledge economy (National Commission on Higher Education, Working Group on Libraries and Information Technology, 1996, p. 1). Graduates of the new system should exit with skills which are attributes of the new information age: the skills to gain access to appropriate information, the ability to evaluate and discriminate between sources, life-long learning skills, and social skills which promote co-operative work (National Commission on Higher Education, Working Group on Libraries and Information Technology, 1996, p. 3). The library, if it has adequate levels of information technology and connectivity, is ideally placed through information literacy programmes to participate in preparing graduates to meet the challenges of the knowledge economy.

A pragmatic example of this approach was the proposal (South Africa, Department of Arts, Culture and Technology and National

Information Technology Forum, 1996) made at the G7 Information Society and Development Conference (ISAD), which took place in May 1996, for the establishment of multi-purpose community centres (MPCCs), but the possible impact of this idea was explored more fully in the complementary conference “Empowering communities in the information society” (International Development Research Centre, Regional Office for Southern Africa, 1996). MPCCs were identified as being one of the best strategic choices for addressing the community needs of previously disadvantaged groups in urban and rural localities. The centres would be an extension, or expression, of the government’s concept of the information community, highlighting the need to link communities with information for development. This is an example of the adaptation of the concept of the information society to local conditions in a developing country where access to infrastructure is not the most critical problem, as many information idealists at the ISAD Conference seemed to suppose. Moreover, it challenges the assumption that the provision of infrastructure and hardware is enough to allow communities to overcome a history of social neglect and to leapfrog into full communion with other members of a potential “information society” (*Weekly Mail and Guardian*, 1996). More recently, Butcher (1998) has offered a balanced analysis of how a development path using ICTs could be sustained in South Africa, including the development of Universal Service Agency (USA) and MPCCs.

It is not surprising, then, that the academic library sector in South Africa has entered a time of considerable change and re-design of its services in response to its perception of the imperatives for the provision of information for development. A central feature of the re-design has been the development of co-operative approaches to ICT provision.

ICT applications and developments in the academic sector

In general terms, the network of libraries belonging to the higher education sector occupy a leading position with regard to IT applications in South Africa. There are various reasons for

this. Diverse LIS sectors have not been able to assume the roles conventionally ascribed to them in other countries. Many functions of South Africa’s divided national library structure, for instance, have traditionally been assumed by the academic sector, and there has been some debate as to whether the country in fact needs a dedicated national library sector at all (South Africa, Working Group on the National Libraries, 1998, p. 8; Coates, 1995; Westra, 1993). Similarly, South Africa’s public library network is both historically biased in favour of recreational service to white middle-class communities, and seriously under-developed as a result in terms of service capacity to the country’s population as a whole. Innovative use of IT in the sector remains inhibited by problems of connectivity over large distances, resource constraints at all levels, and the absence of a coherent national strategy for the sector, especially with regard to its educational role. Corporate and special libraries remain a relatively under-studied sector, and are notably absent from South Africa’s still-fragmented professional associations and literature.

South Africa’s academic institutions are divided in two ways. The first of these divisions is between institutions which were intended, in the period of apartheid, to serve the white population, and were thus well financed and well resourced; and those which were for the use of the black population (i.e. in the terminology of the time, “Africans”, “Indians” and “Coloureds”), and which were located in remote rural areas and starved of funds. Current practice terms these latter the “historically disadvantaged institutions” and current policy aims to eliminate the distinction for practical purposes by the year 2003. The other major divide in South African higher education is between universities (degree-granting institutions) and technikons (granting higher diplomas in technical and vocational disciplines). There has been some erosion of the sharp divide between these sectors with the introduction of the Bachelor of Technology degree in the mid-1990s, and some technikons clearly hanker after some such title as “technical university”.

There is scarcely an academic library left in the world that has the financial resources to purchase all the monographs and journals that it needs, let alone that it wants. Almost all

library consortia therefore attempt to rationalise the building and use of information resource collections through sharing, through granting access (which is "better than ownership", as we all now know). To the extent that they attempt to solve the economic problems of sustaining adequate comprehensive collections by moving operations on to a larger scale, the library consortium is a panacea.

In general, South African academic libraries are still in the process of positioning themselves for the kind of consortial purchasing of electronic information products which is now common in North America and other parts of the world. South Africa is a new market for most vendors, both because South African academic libraries are still largely print oriented, and also because most of them could not afford to buy electronic products outside of a consortial environment. It is evident that such full-text initiatives as JSTOR could offer significant consortial benefits in our context. Nevertheless, it is important to recognise that, infrastructurally, South African consortia do not have access to the connectivity or the general ICT environment which makes this kind of co-operation so effective elsewhere in the world.

There are five major academic library consortia in South Africa, of which two, based in Johannesburg and Cape Town, have reached an advanced state of development. The other three academic library consortia face a different range of problems, which are detailed below. The five groups are

- (1) SEALS, in the Eastern Cape, one of the country's poorest regions;
- (2) GAELIC, based in Gauteng, South Africa's smallest but richest and most economically dynamic province;
- (3) FRELICO, in the Free State, with strong links to GAELIC;
- (4) CALICO, in the greater Cape Town area;
- (5) ESAL, in Kwazulu-Natal.

The Gauteng consortium, GAELIC, has already negotiated at least one beneficial joint deal with a major vendor of electronic information products, and CALICO will almost certainly follow suit in the near future. Both of these groupings (which are described in detail below) are members of the US-based International Coalition of Library Consortia (ICOLC),

and are following developments with regard to consortial licensing closely.

Most of these consortia view the establishment of ICT-based resource sharing as one of their key result areas, and are working towards the introduction of modern library applications software to implement this. However, member institutions of SEALS (South Eastern Academic Libraries' System) have taken a decision not to consider migrating to common software as a priority at this stage. Although there is no clear consensus, this is principally because of the inadequacy of existing intra-campus networks, and the low-grade bandwidth connecting the historically disadvantaged institutions (located in remote rural areas, industrial suburbs or black townships) to the national network. Indeed, the outcome of a needs analysis conducted within SEALS graded human resource development above IT issues in overall importance (Edwards, 1998).

GAELIC is the largest and most rapidly growing of the South African consortia. It has 16 members, including the State Library, with three other institutions (including the University of neighbouring Botswana) reportedly considering applying for membership. In addition, the academic members of the FRELICO consortium, based in South Africa's central Free State Province, have followed the GAELIC lead in their choice of software. GAELIC's choice of the mature and commercially successful INNOPAC software from the USA has placed the product in a dominant position in the small South African market, with half the country's 30 or so academic libraries on board. Having received a major grant from the Andrew W. Mellon Foundation, six "phase one" institutions completed implementation of INNOPAC on their own locally housed boxes in 1998, and another eight are scheduled this year.

CALICO, by comparison a much smaller operation in numerical terms, is nonetheless an important player in national terms. After a prolonged selection process, CALICO opted for the Israeli ALEPH 500 software, which has had significant successes in Europe and Latin America but has not yet broken significantly into the US market. CALICO has also been the standard-bearer for South African institutions in exerting political and moral pressure on the country's telecommunications monopoly,

Telkom, to permit differential tariffs for network connectivity, an essential prerequisite for the successful linking up of consortium member libraries, and the establishment of inter-consortial resource sharing as well.

ESAL (Eastern Seaboard Association of Libraries), based in Kwazulu-Natal, consists of three universities and three technikons, five of them already running the URICA system. The consortium has developed a funding proposal to develop its ICT programme further in a co-ordinated fashion. The odd library out is Natal Technikon and the ESAL application to Mellon includes funds for the purchase of URICA for this library. The basis of the funding application is a proposal to set up a broadcast enquiry function between the seven bibliographic databases (Merrett, 1998).

Table III presents a summary of the institutions and products in use, or about to be implemented, in consortia of higher education libraries in South Africa. The principal sources for the information in this Table are the WGLIT report (National Commission on Higher Education, Working Group on Libraries and Information Technology, 1996) and Malan (1998).

Information literacy

ICTs are useless unless users are “enskked” and empowered to use them effectively. Freedom of access to information is a vital component in the development of learning, particularly within a democratic society. However, simple provision of information sources will guarantee neither that citizens will make use of them nor that they will make appropriate choices about what information to use. Information has always represented a vital resource that has conferred strategic advantage on those able to make intelligent use of it. Successful use of information depends on recognising its salience and value in relation to particular problems.

“Learning organisations” and “information age” are terms often used to encompass the transformation of education practice and the facilitating technologies of storing, retrieving and using information. Educational institutions should foster the personal development of individuals so that they can continue to learn throughout their lives and play a full role in the

life of the nation. Educational practice has, in many sectors, moved from rote-memorisation towards approaches that emphasise the importance of student-centred education: the development of the skills of learning is focused on project work and activities that inculcate a sense of enquiry and debate. For this to be done, students must also acquire the complementary skills of handling information.

The information age poses several problems for learning and information systems. Tertiary institutions have been the organisations shaping a society’s knowledge, and controlling knowledge production through peer review. Now non-governmental organisations and corporate agencies wish to participate in producing knowledge. This trend has led to questions about how to validate information from such sources.

Learners, irrespective of their organisational framework, need to acquire as part of their socialisation, the skills, expertise, confidence and fluency to enable them to learn the specifics of a subject in the context of an holistic worldview of knowledge. This means being able to appreciate their subject discipline in relation to other disciplines so that the perspective on the knowledge they acquire and produce is enriched by others. It means being able to understand the ways in which information flows in fields of knowledge so that they are able to tap into knowledge bases and to make invisible colleges of learners and teachers more apparent. These attributes are usually, but not always, found in more experienced learners: they denote a level of information literacy usually only acquired in the more senior years of the traditional learning institution. While the notion of a hierarchy of abilities is problematic, it suggests that there are levels of literacy that can be acquired earlier on in the educational process.

Information literacy consists, in part, of a set of transferable skills that allow users to identify their information problems and needs, access required information irrespective of source or channel, use and critically evaluate the information. It consists also of an understanding of a domain of knowledge to the extent that an information user is able to evaluate the significance of an item of information in relation to a problem. These abilities will improve quality of life and lead to greater participation in knowledge production and economic development.

Table III Automated library systems in South African higher education institutions

Product	Institutions or Consortia	Comments
<i>CALICO (Cape Library Co-operative)[1] (5 members)</i>		
Aleph 500	Cape Technikon	Individual systems merged into a shared system run on a central computer
	Peninsula Technikon (HDI)	Formerly ITS
	U. Cape Town	Formerly BookPlus
	U. Stellenbosch	Formerly BookPlus
	U. Western Cape (HDI)	Formerly Erudite
<i>GALIC (Gauteng and Environs Library Consortium)[2] (16 members)</i>		
		Coordinated and identical systems are being installed in each individual institution
INNOPAC	U. South Africa	Formerly UNIS
INNOPAC	U. Witwatersrand	Formerly in-house
INNOPAC	U. Pretoria	Formerly Erudite
INNOPAC	U. Potchefstroom	Formerly DTSP
INNOPAC	Rand Afrikaans U. ^b	Formerly Erudite
INNOPAC	MEDUNSA ^b	Formerly Erudite
INNOPAC	Technikon South Africa	Formerly STYLIS
INNOPAC	Technikon Witwatersrand	Formerly ITS
INNOPAC	Technikon Pretoria	Formerly STYLIS
INNOPAC	Vaal Triangle Technikon ^b	Formerly STYLIS
INNOPAC	Vista U. (main campus) ^b	Formerly Erudite
INNOPAC	Technikon Northern Gauteng	Formerly ITS
INNOPAC	U. Venda ^b	Formerly ITS
INNOPAC	U. of North West ^a	Formerly Erudite
INNOPAC	Technikon North-West ^a	Formerly ITS
Notes: ^a Implementation of INNOPAC not yet started; ^b Implementation of INNOPAC currently under way		
<i>FRELICO (Free State Libraries and Information Consortium)[3] (5 academic library members; includes other non-HE members)</i>		
INNOPAC	U. Orange Free State	This consortium is a "node" of GALIC
	U. Vista (Bloemfontein)	
	U. Vista (Welkom)	
	U. of the North at Qwa Qwa	
INNOPAC	Free State Technikon ^a	InMagic (DOS-based)
Note: ^a Implementation of INNOPAC not yet started		
<i>ESAL (Eastern Seaboard Association of Libraries)[4] (6 members)</i>		
URICA	U. Natal (two campuses)	
URICA	U. Durban-Westville	
URICA	Technikon Mangosuthu	
URICA	M. L. Sultan Technikon	
URICA	U. Zululand	
Biblios	Technikon Natal	

(Continued)

Table III

Product	Institutions or Consortia	Comments
SEALS (South Eastern Academic Libraries' System) (8 members)		
Erudite	U. Fort Hare	Use of a common system is not considered a priority because of connectivity problems
URICA	Rhodes U.	
URICA	U. Transkei	
ITS	Transkei Technikon	
URICA	U. Port Elizabeth	
ILIS 2000	Border Technikon	
Erudite	Port Elizabeth Technikon	
Erudite	Vista U. (Port Elizabeth campus)	
Not consortium members		
URICA	U. North	A historically disadvantaged institution (HDI) located in the rural area in the north of the country: considering joining GAELIC
<p>Notes: [1]http://www.adamastor.ac.za/Academic/Calico/portal.htm [22 January 1999]; [2]http://www.sabinet.co.za/gaelic/home.html [22 January 1999]; [3] http://www.uovs.ac.za/lib/frelico/index.htm [22 January 1999]; [4] http://www.esati.co.za/html/eastern__seaboard_association_of_libraries.htm [22 January 1999]</p>		

Implicit in this notion is a strategic view of information that rejects the assumption that all information has intrinsic value. Instead, it is assumed that information assumes value in relation to a need, and that records of information represent a particular perspective that is framed by the worldview of its user. This perspective explodes the notion, first, that information is neutral and, second, that it represents something commonly known as “absolute truth”. With increased access to information sources, users need to be able to evaluate or value the information they use. Learners need to transcend early ideas of duality that suggest that opinions are either good or bad but never nuanced or grey.

Users of information have to develop an ability to identify appropriate information, so that what appears in a good-looking journal or is the most recent Internet source is not regarded as valuable simply because of its prestige or novelty.

For the higher-education organisations in South Africa on the point of introducing consortial approaches to automation, the need to ensure that students, faculty, library staff and administrators acquire such competence is vital.

Sayed concludes that, “in the South African context, information literacy must take due cognisance of the prior learning experiences and contextually specific teaching and learning practices” (Sayed, 1998, p. 164). This imperative suggests that within the higher-education context of South Africa, two agendas exist. The first, explicit, agenda is to ensure that the ICT systems installed by academic libraries can be used: there is a need to “enskill” users and to ensure that such systems are supportive of a range of experience. Although features such as voice input may eventually offer an alternative to the keyboard, it is the use of this device and its accompanying pointing device (mouse, trackball, touchpad or whatever) that is a major hurdle for many users. The availability of computers in schools and homes is low compared with many developed countries and the corresponding rate of computer literacy is low. De Jager (1998) found, in a study of students at the five higher-education institutions of the Western Cape, that the highest reported rate for “competent use of a word-processor” was 55 percent.

The second, or implicit, agenda is to improve the information-handling skills of users. The political system of the former apartheid period

was designed severely to limit the quality of education given to the majority of the population; inevitably the “advantaged group” also received a damaged education because of the restrictions placed on access to information and the deliberate supply of misinformation. A culture of open enquiry had little chance to develop and the need to question “authorities” was not encouraged. Makhubela and Koen (1995) describe the need to teach students to analyse critically and to evaluate the information sources and quality of information they use: this need is especially evident amongst students at historically disadvantaged institutions but the needs of staff and of students at many historically advantaged institutions are also pressing. An awareness of the political nature of information is a “life skill” for the Information Society and especially so in an emerging and fragile democracy such as South Africa.

CALICO, uniquely among South African consortia at present, has explicitly recognised the need for information literacy. Within the CALICO institutions, a core of techniques is being developed and tested with a view to offering a learning path available to all students and staff. At the outset it has been recognised that the acquisition of information literacy is a key “life skill”, or competence, usable within the workplace and beyond. It has also been recognised that crowded timetables leave little room for additional teaching and that self-learning approaches are to be preferred. Another important point is that the acquisition of information literacy is assumed to work best within a context or subject domain where the learning is directly related to a project or academic assignment. Thus, the proponents of information literacy are arguing for space within other academic programmes, but attempting to link such learning directly to the existing syllabus of the programme rather than “add on” another, independent, component.

An example of contrasting approaches has been the delivery of two courses at the University of Cape Town (UCT). The first, “information tools and skills” was designed by the staff of the UCT School of Librarianship (now the Department of Information and Library Studies) in association with the UCT Writing Centre and UCT Libraries as a first-level course for undergraduates in the Faculty

of Social Sciences and Humanities. The course consisted of modules of lecture/demonstrations, practicals and some seminar work, assessed through a project chosen from a range of “social science” topics and a conventional written examination. This aimed to test participants’ abilities to locate and use appropriate information sources, evaluate and synthesize the information obtained from those sources, as well as the ability to explain concepts of information use. The linkage between the course and the other academic subjects pursued by participants was relatively weak, but the course had the advantage that it had its own slot in the academic timetable and did not encroach on the teaching space of colleagues. This course was also modified and translated into an HTML format to allow it to be delivered to students of the Arts Faculty of the University of the Western Cape over the World Wide Web, as a test of the “portability” of such courses. It was unsurprising to discover that lack of adequate and reliable connectivity was a major hindrance to the success of this project; it was more surprising to discover how critical to success the course designer’s assumptions about the computer literacy of students could be [1].

The other approach is exemplified by a module run within a short course for the Department of History at UCT on “liberation in Southern Africa”. Here the module was specifically designed to address the information location and evaluation aspects of a project used to assess the progress of participants. Success depended entirely on being able to convince the course leader that the module was worthwhile and being able to demonstrate to participants that significant learning advantages could result from their comprehension of the contents of the module.

A third approach is also being tried. The need has arisen to provide a learning tool for higher-degree students and staff who are new, or relatively new, to the use of the Internet as a tool to aid research. With funding and advisory support from the Centre for Science Development (CSD) of the Human Sciences Research Council (HSRC) a subject-based information gateway (SBIG) has been developed. The site, “Yenza!” [2] explores how to use the Internet for research and teaching in the humanities and social sciences. As well as describing and showing how to use various facilities such as

electronic mail and search engines, Yenza! also exemplifies the "research journey" and links this to appropriate electronic resources along the way. A key point in the design of Yenza! was to make it simple to use and the only assumption which is made is that users are familiar with the use of a Web browser. The site designers have also been careful to use features and formatting choices which can be displayed on a variety of browsers in addition to those from the Netscape and Microsoft stables and using early versions of all of the browsers. This decision was an imperative once it was recognised that even within the Western Cape region there was little uniformity of browser in use; because Yenza! is intended to be available to any South African higher-education institution the designers had also to take account of an even wider diversity outside the region.

Library ICT

Solving some old problems and creating some new ones?

We close this account of the application of modern ICTs in the South African higher education institutions with a few remarks about the broader political context.

There are two grand challenges facing academic librarians in South Africa, and indeed in the rest of the world as well. The first is the well-recognised problem of how to preserve and sustain what is valuable in the traditional print-based library, while integrating this practice with rapidly-changing ICTs, which are seen by some to threaten the need for librarians altogether. The second challenge is the discernible commodification of information through the expansion of a new global intellectual property rights regime, and the commercialization of the Internet. The decentralized and essentially subversive character of cross-border data transmission is in direct conflict with these trends. In other words, the technology allows us to do what we want, but economics and law may conspire to prevent us from doing it.

The academic world has already "lost" the Internet to commercial interests. Online trade on the Internet was projected to reach \$24 billion in turnover in 1998, twice the amount

generated in 1997 (Tran, 1998). Much of that turnover was in key areas such as direct hardware sales, travel services, and specialised niche products. International Data Corporation predicted that the figure would grow to \$95 billion by the year 2000, while the *Economist* estimated that it would fall somewhere in the range of \$60 - \$160 billion (Wright, 1997). Even though making large profits through Internet trading remains problematic for those who wish to do so, the mere prospect of this happening makes it unlikely that cheap networking technology will come to the rescue of resource-strapped South African librarians in an unproblematic way.

For one thing, effective use of ICTs requires extensive access to broad bandwidth connectivity, which does not yet exist in South Africa. In the USA, where the telecommunications market is deregulated, relatively small specialist companies such as Residential Communications Network (RCN) are currently providing the three core services of Internet access, voice telephony and cable television by connecting homes even in poorer areas such as Harlem for about \$1,150 per dwelling (McCourt, 1998). Essentially this means that within the foreseeable future massive connectivity via fibre-optic cables will reach even into poorer homes in the wealthy Boston-Washington corridor, which covers 4 percent of the land area of the USA, but contains 25 percent of the population. It is hard to see this model being extended even into relatively wealthy lesser developed countries (LDCs) such as South Africa, with a dispersed population marked by huge divides in disposable income: how much less likely into the rest of the continent.

While the Web expands and becomes more secure, and as its full commercial potential begins to be realized, the indebtedness of most African countries also continues to rise exponentially. Sub-Saharan Africa includes 33 of the 42 countries classified as "highly indebted" by the World Bank (Elliott, 1998, quoting the UN's latest Human Development Report).

A new regime of international law to enforce Northern property rights and control over information has already quietly been put into place. For information workers and librarians in Africa and other parts of the Third World, this is not an encouraging prospect. For most of us in the South, the electronic library may turn out

to be, not a gateway, but even less sustainable in the developing world than its traditional counterpart.

It is true that there has been exponential growth in Internet access within Africa in the immediate past. In May 1996, only 16 African countries had full access, from a total of 56. Now 44 countries are wired (Jensen, 1998). But it is a mistake for librarians to assume that this represents anything more than its extension to the local membership of the golden billion, as the global middle-class has sometimes been dubbed.

The Internet-based electronic library – however conceived – does provide us in Africa, in the abstract, with the technological means to share resources and serve users. However, we are already finding out that this is most emphatically not accompanied by the necessary concrete economic or legal conditions that would allow us in the South to maximise the free flow of information in order to better people's lives.

The legal conditions referred to have found specific expression since 1993. For many librarians and information professionals, the broad issue of intellectual property rights is normally seen through the narrow prism of the impact of copyright law on their daily activities. However, as Frow (1996), among others, has argued, the imposition of the present world trade regime at the conclusion of the Uruguay Round of the General Agreement on Tariffs and Trade, in December 1993, "marks a clear historical demarcation in the global control of information". As a profession committed to the free flow of information, we must pay serious attention to the implications of this break with the past.

As Frow points out, a key Northern objective in 1993 was to extend intellectual property rights through patent law to such new areas as pharmaceuticals and agro-chemicals, whose products – medicine and food – are fundamental to human wellbeing. The view of the USA and other industrialised countries was, and remains, that the knowledge-and-information components of these commodities are themselves private capital goods. A much more common view in the rest of the world, and especially among LDCs, rests on the traditional idea that the basis of scientific method is full disclosure. This in turn makes information and knowledge broadly a public good, both in the sense that they are non-depletable, and in the

legal sense that they should not be commodified (that is, bought and sold).

The commodification of information in the global economy is a gloomy prospect for librarians who have been trained in the liberal tradition of the free flow of information. It seems that we will not be able to enter the electronic library of the future without a credit card. Nevertheless, the nature of the technology itself may offer a ray of hope. The copyright law that emerged in the seventeenth century protected the commercial interests of those producing fixed and printed texts, and was the basis for our highly individualistic idea of authorship. In the same way, the fluid, non-linear and impermanent nature of the electronic text will probably change the way in which research is reported. In fact, a powerful case is already being made that the electronic revolution is changing the fundamental nature of scholarly discourse. Stanley Chodorow has correctly pointed out that the "current geography of information is the product of the seventeenth century doctrine of copyright". Its origins lie in the political interest of the state, and the commercial interests of publishers and booksellers, as well as in the fixed nature of the printed text. But because an electronic text is fluid, and can be altered on the fly, Chodorow goes on to argue that in the foreseeable future

[a] work of scholarship mounted on the Internet will belong to the field it serves and will be improved by many of its users. Scholar-users will add to the work, annotate it, and correct it, and share it with those with whom they are working. All the really important works of scholarship, the works we commonly call research tools, will quickly evolve into several subspecies in the hands of scholar (Chodorow, 1997, p. 10).

Some commentators have gone further, and have argued that the technology may eventually do away with the organisational base of higher education, the campus-based university, altogether. Noam writes that the historical origin of the university is centred on the library:

[s]cholars came to the information-storage institution and produced collaboratively still more information there, and students came to the scholars (Noam, 1995).

In this model, people came to the information: this is the basis of the organisation we call the library. The Internet changes all that:

information comes to the people instead, and Noam argues that the economic basis of the organisations we know as universities and university libraries are and will be threatened by this fundamental change.

Libraries and information systems in Africa and in the Third World are in trouble, and have been in trouble for some time, as we all know. As Agha and Akhtar have pointed out several years ago,

[s]tudies indicate that information systems in developing countries usually thrive when assisted with external aid through the development of products and services, along with related infrastructural development. Unfortunately, however, once aid ceases, the information systems tend to function at a lower level of productivity, or on occasion, become inactive (Agha and Akhtar, 1992, p. 284).

In a recent North American book on legal aspects of the information society, James Boyle argues that the trend set at the 1993 GATT negotiations

[...] leads us to have too many intellectual property rights, to confer them on the wrong people, and dramatically to undervalue the interests of both the sources of and the audiences for the information we commodify (Boyle, 1996).

Conclusion

Despite the problems outlined above, the imperative within Africa is for change and well-designed technology is regarded as a critical component. The conference on building the information community in Africa (British Council, 1999) lists among its aims:

Human resource development

- Ways of developing ICT skills and creativity effectively and sustainably among users in the community, focusing on shared practice between practitioners and the local communications industry.
- Exploring alternatives to the already over-stretched existing educational and training infrastructure to enable individuals to use connectivity to develop a business or become a teleworker and to enable learning and create a lifelong learning education and training system.

- Expanding resources through an active role for civil society in, for example, disseminating information and organising volunteers to deliver skills.

Partnership

- The core theme running through all other themes will be partnership as a means of achieving sustainable development. Attention will focus, in particular, on business case driven models and sound investment vehicles which deliver development goals.

It is to be hoped that fresh insights and initiatives will come out of this and similar endeavours.

Notes

- 1 <http://www.sol.uct.ac.za/> [22 January 1999]
- 2 <http://www.geocities.com/~yenza/> [22 January 1999]

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