Training librarians for the digital age in African university libraries

Elisha R.T. Chiware¹

Abstract

African universities have made tremendous strides in implementing computerization projects both through their own funding and donor support. Various types of Information Management Systems (IMS) for administrative and academic purposes are now operational in these institutions. African university libraries have benefited in the process, with many digital projects now being implemented. The benefits include implementation of integrated library automation systems, the creation of standalone databases, digitization of theses and dissertation collections and lately the creation of various types of IR (Institutional Repositories). The digital age is here to stay with us and for African university libraries the pressure to go digital has never been more apparent. There are still many challenges, though, facing African university libraries in the implementation of digital library projects, especially regarding funding, human resources training and retention of skills, Internet connectivity, telecommunications infrastructure, copyright issues, etc. This paper analyses some of the existing literature on digital libraries education and training and attempts to outline the training requirements in African university libraries for sustainable implementation of digital projects. The areas that training for the digital age should focus on are: awareness of digital projects, the tools and resources for building digital collections, collection development and management and the marketing of the digital resources. The continued brain drain from the continent poses a serious threat to both knowledge creation and its management, and the paper suggests what African university libraries could do to retain skilled manpower.

1. Introduction

¹ Elisha Chiware is Lecturer in the Department of Information and Communication Studies, Faculty of Humanities and Social Sciences at the University of Namibia, Windhoek, Namibia. He can be contacted at echiare@unam.na
The creation of digital library and archive services, digitization and long-term preservation of intellectual and cultural goods and artifacts will assist in the development of African countries. Digital library technologies offer African countries an opportunity to preserve its traditions and knowledge. African universities as knowledge creators and their libraries as gatekeepers of knowledge are rapidly witnessing the introduction of various digital technologies. Libraries with resources and those with good donor support have moved to implement integrated library systems, to build digital collections, Institutional Repositories (IRs) and to provide electronic services such as access to: Internet, online journals, e-mail, and workstations for general computing needs like word processing, spreadsheets, data analysis and a host of other computer-based applications.

One of the challenges facing digital library projects in Africa has been the readiness of the university libraries in terms of skills and knowledge to implement the digital and electronic library services. Rosenberg (2006) notes that skills in e-resources management, e-services development, full text digitization and teaching skills are lacking in African university libraries. There are also many other challenges regarding funding, IT infrastructure, Internet connectivity, lack of commitment from staff and or/ management and the availability of African generated content to put into the digital collections and IRs. There is increased demand for librarians with skills needed to initiate, manage and participate in digital library projects (Jacso, 2002). Many donors like UNESCO, FAO, Andrew F. Mellon Foundation, Carnegie Foundation and the AAU (Association of African Universities) have provided support in the training of librarians to implement digital libraries projects. Some universities libraries have established dedicated IT units in order to address the problem of lack of IT skills among librarians. And where integrated library systems have been implemented vendor training has always ensured that staff is adequately trained to run the turn-key projects. The question, however, is “what are the training requirements for this digital age for librarians in African university libraries and do African university libraries have adequate resources to meet the training requirements for the digital age projects?”

The requirements for training to, design, implement and manage digital projects and electronic library services in university libraries are varied (Bawden et al., 2004). They must cover nearly all aspects, from understanding the current state of affairs in Africa, to the skills and techniques required for implementing and managing digital collections. It must also cover the processes of collection development and management and to making digital collections accessible to the academic and research communities. The training of staff in African university libraries can either be through continuing educational programmes or through formal training in library and information science (LIS) and computer science schools. Given the pace of developments in digital library projects and electronic information services provision on the African continent it is important that management in African university libraries come up with sustainable solutions to training. While the brain drain from the continent continues to pose threats to knowledge creation and its management in the African university, solutions must be found to the building of collaborative links for skills transfer with Africans in the Diaspora.

2. The skills requirements for the digital age in African university libraries
The skills required for the digital age in African university libraries should address three main areas. The first should be an understanding of the current state and prospects of digital libraries in African universities and familiarization with the major projects in other types of institutions. Secondly the training should be on skills to handle resources and the technology context for digital libraries, tools and rules (protocols) of interoperability. Lastly there should be an understanding of the enhanced features offered by the digitized content and digital resource discovery tools. And about collecting, organizing and presenting information about digital resources and creating annotated web based access tools.

2.1 Understanding the current state and role of digital libraries in African universities

In training librarians in African universities, whether it is through formal programmes in library schools or through workshops and other forms of short courses, it is important that trainees understand the current state and prospects of digital libraries in African university libraries and other types of libraries as well. Librarians should understand the global trends in digital library projects and the trends in developing economies and more specifically in African countries. The African university library personnel should be familiar with major projects currently taking place on the continent, like the DATAD (Database for African Theses and Dissertations), DISA (Digital Imaging Project of South Africa), the African Virtual University and the various institutions that are building digital collections (electronic theses and dissertation databases and past examination papers) and IRs (Institutional Repositories) and other archival deposits and collections.

There is need to understand the role of digital collections in African university libraries as sustainable tools of information collection management and preservation. An understanding of the current state of projects and more specifically the challenges and opportunities in digital library management will provide a sound basis for technical training for those involved. The various approaches to building digital research resources appropriate to the needs of the African continent must be explored (Peters & Pickover, 2001). The understanding of the state of digital library scenario should also involve awareness of open source software for libraries, sources for donor funding and training for digital projects. Trainees must learn more about open source software like DSpace, Greenstone, and the concept of Creative Commons and many other platforms that can assist in building digital collections. Open source software has by and large solved the problems of software accessibility by many African university libraries which can not afford software on the open market. However, accessing open source software requires a certain degree of expertise not only in down-loading it, but installing it, managing it and keeping up-to-date with developments in the software. Furthermore, libraries should view open source as not completely free, but be prepared to invest in training staff on the use of open source or hire consultants for implementation of projects.

Librarians should also be exposed to project management skills, and this should involve the knowledge of selling and justifying such projects to management. Librarians must know how to write digital library projects proposals, not only for donor funding but also for funding coming from their own institutions. Training in project management must also involve building skills in project planning and management as they are important in the success of any digital library projects. Some of the most important aspects of project management include understanding the project requirements, the role of planning, accurately determining budgets and schedules,
controlling the scope of the project and developing expertise. They should understand the challenges of managing digital library projects i.e. what are the likely pitfalls and how can they be addressed.

2.2 Building digital collections: tools and resources

The training of librarians in information technologies that are used for building digital collections should be on hardware, software and networking requirements for digital projects. This should involve the use of various computer hardware and software packages that are commonly used in building digital collections. Trainees should have knowledge of vendors and suppliers of the hardware required for digitalization like desktop workstations and capture devices (scanners and printers). Trainees need skills in determining hardware capacity and their handling capabilities for digital collections.

Equally important in African university libraries is the knowledge and skills to access open source software for libraries and to adapt it to their local environments. The training of librarians at this stage should involve an understanding of the enhanced features offered by digitized content and digital discovery resources tools. Training should be in software acquisition processes either through vendors or open source platforms. Further more trainees must have in-depth knowledge of how to evaluate the suitability of software for the digital projects in their libraries.

There is need for skills in managing web servers, web publishing, web access and information retrieval, conversion processes, database management systems and multimedia systems. This training should also include the use of project management software to manage the digital projects as well as rights management software. They should know what kind of training is required for using the selected software package. The training in technologies for building digital libraries must also include network management. Trainees must have sufficient training in networking and storage technologies, network processors and gateways as well as networking operating systems.

There is a need to explore training opportunities in exploiting the new possibilities allowed through Web 2.0 developments and services, many of which are freely available. African university librarians have a role to play in participating in Web 2.0 community networking initiatives for the benefit of their local users and others.

2.3 Organizing, managing and presenting digital information to users

The other important area of training is that of collection management, cataloguing and classifying and presenting information in digital format, copyright issues and creating various gateways to these resources in African university libraries. It is also important to impart skills in good information retrieval techniques in the changing environment. There in need to build capacity and an understanding of the changing nature of collection development in the digital age and the cataloguing and indexing of electronic resources. There should be a development of new

---

2 Web 2.0 - a phrase coined by O'Reilly Media in 2004, refers — especially in the context of marketing computer-based services — to a perceived second-generation of Web based communities and hosted services — such as social networking sites, wikis and folksonomies — that facilitate collaboration and sharing between users. O'Reilly Media titled a series of conferences around the phrase, and it has since become widely adopted.
skills to determine users’ needs and ways of satisfying those new requirements in a digital environment.

A new concept of digital collection is evolving incorporating adaptations of many old features and standards, and creation of many new ones. This conceptual and pragmatic evolution is far from over. Furthermore, the concepts and processes of collection development and collection management are undergoing a transformation as well. This is due to the effect of great many and diverse digital resources and tools that can be used in collection development and that are generally and easily available through the Internet. The process of collection management is now closely connected than ever with means, ways, and policies for access, adding an additional dimension. The training of librarians then in African university libraries must take cognizance of these developments.

Other challenges of collection development and management relate to preservation and archiving. Libraries are now including digital preservation as vital part of collection management. A number of national and international bodies are developing standards, tools, and practices related to preservation (Saracevic, 2001) and African university libraries can learn from these experiences.

It is important that training programmes build capacity to create suitable subject gateways and directories that are easily accessible. The question of access has also been a challenge to the digital collections that are currently emerging in African university libraries. Often it is very difficult to access websites and web pages that contain important information and links to databases. Problems of access and low usage of electronic resources in African university libraries have also been experienced due to lack of adequate PCs, frequent power cuts, slow Internet speed and lack of awareness of the existing electronic resources.

Another are requiring training in African academic libraries in building digital collections is in issues of copyright law. Some people have criticized that digital libraries are hampered by copyright law, because works cannot be shared over different periods of time in the manner of a traditional library. The content is, in many cases, public domain or self-generated content only. Furthermore many academics in African universities are sceptical to have their work published in IRs for fear of lack of expose in internationally accredited journals and plagiarism. The training of librarians must therefore address issues related to copyright law in a digital environment and how digital libraries should address copyright issues. Librarians should have the skills to actively promote the benefits of publishing in local IRs to local academics. This however, should have institutional support in terms of changing conditions of tenure and promotion to include works published in various types of IRs. The other problem is lack of incentives for academics to publish in local IRs due to libraries shrinking budgets. Academics often prefer their works to be published by commercial publishers and yet digital libraries should accommodate copyright concerns by licensing content and distributing it on a commercial basis and allow for better management of the content’s production and the payment of royalties (if required).

The last part of training should involve information skills to enable easy access and the utilization of digital collections in African university libraries. Trainees should be aware of how
to conduct user needs assessments and how to respond to the needs of users. Content should also include users and uses of digital libraries, usability and evaluation research and information behaviour in digital libraries. Increasingly many programmes like DOAJ (Directory of Open Access Journals), Open J-Gate, PERI (Programme for the Enhancement of Research Information) of INASP (International Network for the Availability of Scientific Publications), HINARI (Health Inter-Network) and many others are providing open access to journals and other types of research materials to African university libraries. Enough training must be provided to enable librarians to use these resources. There is also a need for African librarians to be able to train African academics to use these open access materials. Even more important is that African librarians need advocacy skills for ensuring that locally developed IRs are well populated and that African academics understand the benefits of deposits in IRs.

3. Approaches to training for the digital age

Models on digital library education are still evolving and can be witnessed by variety of courses offered in LIS programmes. In 1999 Spink and Cool (1999) in a global survey on digital library education found out that a few library schools were offering courses on digital libraries and that a sound conceptual framework for digital library education had yet to be developed. However, while many schools had not developed digital library courses, they are aware of the need to develop curriculum in this growing area of research and practice. Liu (2003), in another web-based survey of global trends in digital library education, observed that new and positive directions in digital library education had been posted in several LIS programmes. There were many hands-on digital libraries courses although some of the courses were not up-to-date in the field of library and information technology.

In developing countries, digital library education has also not been sufficiently incorporated into library and information science programmes. Although there are a few donors supporting continuing training educational programmes, these are not adequate to address the needs of the libraries in all African countries. The two avenues currently open to addressing training requirements for the digital age in African university libraries are through continuing educational programmes (workshops and short courses) and formal training in library and information science (LIS) and computer science programmes.

3.1 Continuing educational programmes

The training of librarians on the job is one approach that African university libraries have pursued over time with a good measure of success. According to MacLeod & Chware (1993) for in-house training programmes in any automation projects in university libraries to succeed certain prerequisites must be in place. These are:

- There must be sufficient amount of training given to project staff, given if possible before the digitization commences;
- There must be recognition for extended training beyond those areas necessary for immediate job performance;
- There should be no time delays between the end of training and the digital project going live;
- There should be agreed training goals;
• There should be a high level of management involvement in the design and implementation of the training programmes and
• There should institutional commitment.

There should be an agreement that training should be considered to be a continuing process and that librarians are given enough opportunity to put to use their newly acquired skills. In other words, in-house training programmes must be specific and targeted at achieving certain goals.

Another form of continuing education is sending trainees to workshops, short courses, placements in other libraries and on-site visits by experts. This, however, depends on the availability of the courses, funding and commitment from management to send off trainees to these courses. UNESCO and FAO (see http://www.imarkgroup.org) and many other donors have actively supported staff development of librarians for implementing digital library projects especially in the implementation of the Greenstone Digital Library software (for building and distributing digital library collections), D-Space (a digital repository system that captures, stores and indexes, preserves and distributes digital research materials), Eprints, Fedora, dLibra and many other packages. The Association of African Universities has provided funding and training for the DATAD project (digitization of theses and dissertation collections in several African university libraries). The PERI project of INASP has provided training programmes on how to access electronic resources to many university libraries’ personnel in Africa and other developing countries. The Tilburg University in the Netherlands offers an annual summer course on digital libraries. And there are many other projects that are currently going on in African university libraries to build skills capacity for digitization projects.

The content of short in-house courses must be well designed to meet the immediate needs of practicing librarians. There is often blame that short courses and workshops are expensive and are not exhaustive enough. Experience has shown that in some African university libraries the courses are attended by the wrong people or people without sufficient IT background. Library staff should not be sent on short computer courses if there is no immediate need of the skills in their libraries. IT skills are best put to use soon after training. But libraries often send people on short courses simply because there is a donor who is willing to pay.

What is required are a series of short courses that are designed to take participants through various stages of digitization rather than trying to address everything at one go. The levels of training must also be clearly defined so that participants are not short changed and end up with pieces of paper that are meaningless. This will however depend on the commitment of management and the availability of funding, trainers and time for participants to leave their jobs and go for short courses at given intervals over a long period of time.

3.2 Formal library and information science programmes
Library and information science and computer technology schools in African countries should now be seen as the key to imparting skills and knowledge on digital library projects. Considering the increasing demand for librarians with skills needed to initiate, manage and participate in digital library projects, there is a need to integrate digital library issues into the LIS curricula in African library science and information science programmes. It is only these established programmes that can guarantee a sustainable source of a cadre to implement and manage digital
library projects. The traditional library school training has to incorporate the latest technology developments.

There has been a growth of LIS education in Africa in the last 20 years and there has been an increase in the integration of ICTs in LIS curricula (Ocholla & Bothma, 2007). However, Rosenberg (2006) has noted that library school curricula in the ICT area have not kept up to date with the needs of the new e-environment, with the result that new recruits do not have necessary ICT-related knowledge and skills. In addition Rosenberg (2006) also notes that those responsible for teaching require opportunities to upgrade their knowledge and skills prior to designing and teaching the new courses.

A recent IFLA/ALP3 sponsored workshop on “How to integrate ICTs in LIS curriculum in Africa” noted that African library and information science programmes are at different stages of integrating ICTs into their curriculum. Some are well advanced due to the availability of resources and trained staff, while others are still struggling to get access to resources to enable them to make ICT teaching more effective. Ocholla & Bothma (2007) have noted that the component of ICTs in LIS programmes in Africa usually include courses on computer literacy, ICT, hardware and software (for LIS and in general), databases, information systems and systems development. The IFLA/ALP workshop recommended several areas that should be included in ensuring ICT integration in LIS programmes and these are:

- Knowledge and evaluation of software, hardware, operating systems, and installation of software;
- Word processing, spreadsheets, graphics, presentation;
- Web browsing and Internet searching;
- Database design and implementation, conversion of records from and to various formats;
- Compiling joint databases and publishing databases on the Internet;
- Data analysis with statistical techniques;
- HTML and XML coding – advanced level (library portals), and
- Creation of local content through digital libraries and institutional repositories,
- Desktop and E-publishing, digital photography and videos and Pod-casting techniques.

Urs (2002) has suggested that the core areas for a models digital libraries training in LIS programmes should be on:

- **Information users** and should involve understanding the user, identifying and analysing user needs, and the reference interview and query formulation;
- **Information resources** and should involve the identification, evaluation and selection of information resources to be included in the digital collections;
- **Value addition processes** and should involve the compilation of bibliographic databases, developing virtual libraries, design and development of user interfaces, organizing (classification, cataloguing, indexing and abstracting) information resources and

3 IFLA/ALP sponsored workshop on Integrating ICTs in LIS was hosted by the Department of Information and Communication Studies, University of Namibia, 22-24 November 2006 at Safari Court Hotel, Windhoek, Namibia and was attended by participants from ten universities in eastern and southern African region.
information analysis and consolidation, design and development of e-content and the development of digital libraries;

- **Information technologies** and should involve systems study/analysis and requirements analysis, IT market survey, identification and selection of suitable hardware and software for automation, LANs, Internet, Intranets, setting up the system, data conversion website development and registration and

- **Information management** and should involve planning, resource management, developing decision support systems, organizational re-engineering, information flow and management, project management, market research, pricing and marketing, evaluation and quality management (see also appendix).

There are many other models that have proposed and in most cases they broadly cover the same areas (Bawden et al, 2004). The above outline of the course content for digital libraries education is exhaustive and for LIS programmes in Africa it might look to be a big challenge to cover all the areas exhaustively. However, what is important is to include as many areas as possible and cover the basics and where resources permit the entire content can be covered.

### 4. Staff Retention strategies

The loss of qualified personnel in African countries to the west is also posing serious problems to universities and their support services like libraries. Universities are now competing with local industry and private research and development institutions to attract qualified staff. Even more worrying are the continued cuts in funding to universities that is affecting their ability to offer better remuneration packages, to build better research infrastructure and provide more information resources in libraries.

How do we retain skilled librarians especially those with IT skills in our libraries? This is a real challenge that needs to be addressed sooner than later. The attractive salaries and lifestyles in western countries have led to the brain drain in African universities including libraries. It takes a lot of investment to train a librarian and more so one with IT skills. How do we keep up with inflationary, unstable political and economic environments?

The first and obvious solution is higher salaries and better working conditions. But what are higher salaries and better working conditions? Can all countries for example match what is offered overseas or in other better developed African countries like South Africa, Namibia and Botswana? How do we keep up with inflationary, unstable political and economic environments?

There have been suggestions that we should work with Africans in the Diaspora so that we can find means and ways of using their skills while they retain their newly found western bases. The Association of African Universities (AAU), which hosts the Working Group on Higher Education (WGHE) of the Association for the Development of Education in Africa (ADEA), is looking to identify, document and share promising institutional efforts to retain qualified and skilled personnel, and use of expertise in the Diaspora, to contribute to the development of higher education, science technology and innovation in Africa. Is this really feasible for African libraries’ digital projects or this approach could be used in other areas like medicine, economic planning and policy formulation? The question of the brain drain needs more research so that
solutions can be found as to how essential skills can be retained on the continent or at least to make use of those who have decided to move to new bases in the west.

5. Conclusion

The digital age has brought many opportunities and challenges to the African university libraries and research institutions. For the African university libraries to make it in the digital age, they must make sure that staff is adequately trained to initiate and manage the digital resources. The training requirements for librarians in African university libraries to support digital and electronic services provision are many. They should be addressed both through formal education in library and information science programmes and as part of continuing education for staff. It is also important that in developing an educational programme for digital libraries employers and trainers should look beyond competencies and skills to changing the philosophy, attitudes and mindset of the professionals in the field. There is need to continue research into what kind of models should be used in the training of African librarians for the digital age.

References


Appendix
Core areas for digital librarianship in LIS programmes that can be adapted for African LIS programmes (Urs 2002)

<table>
<thead>
<tr>
<th>Area</th>
<th>Tasks</th>
<th>Requisite Knowledge &amp; Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information user</td>
<td>• Understanding the user</td>
<td>• Theoretical underpinning of use studies</td>
</tr>
<tr>
<td></td>
<td>• Identifying and analyzing user needs</td>
<td>• Qualitative research methods</td>
</tr>
<tr>
<td></td>
<td>• Reference interview</td>
<td>• Quantitative research methods</td>
</tr>
<tr>
<td></td>
<td>• Query formulation</td>
<td>• Psychological tools</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Search strategies</td>
</tr>
<tr>
<td>Information resources</td>
<td>• Identification</td>
<td>• Types – print &amp; electronic</td>
</tr>
<tr>
<td></td>
<td>• Evaluation</td>
<td>• Nature &amp; characteristics</td>
</tr>
<tr>
<td></td>
<td>• selection</td>
<td>• Meta sources</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Searching &amp; search engines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Norms, techniques and procedures of evaluation</td>
</tr>
<tr>
<td>Value addition processes</td>
<td>• Compilation of Bibliographies, databases</td>
<td>• Theoretical (logical, linguistic, psychological) foundations of knowledge organization</td>
</tr>
<tr>
<td></td>
<td>• Developing Virtual libraries</td>
<td>• Paradigms of knowledge organization</td>
</tr>
<tr>
<td></td>
<td>• Design and development of user interfaces</td>
<td>• Indexing languages, tools and techniques for knowledge representation</td>
</tr>
<tr>
<td></td>
<td>• Organizing (classification, cataloguing, indexing, abstracting)</td>
<td>• Resource cataloguing &amp; description: records formats, METADATA, organizing Internet resources</td>
</tr>
<tr>
<td></td>
<td>Information resources; information analysis and consolidation</td>
<td>• Programming languages, DBMS</td>
</tr>
<tr>
<td></td>
<td>• Design and development of e-content</td>
<td>• Authoring software tools, multimedia / hypermedia tools</td>
</tr>
<tr>
<td></td>
<td>• Development of digital libraries</td>
<td>• Electronic publishing, SGML, HTML, DHTML, XML, PDF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Digitization techniques</td>
</tr>
<tr>
<td>Information Technology</td>
<td>• Systems study/ analysis and requirements analysis</td>
<td>• Understanding of information &amp; communication technology hardware: computer, telecommunication,</td>
</tr>
<tr>
<td></td>
<td>• IT market survey</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identification and selection of suitable hardware and software</td>
<td></td>
</tr>
</tbody>
</table>
| Information management | Planning: strategic & tactical  
| Resource management: finance, human resources  
| Developing decision support systems  
| Organizational re-engineering  
| Knowledge management: information flow management  
| Workflow management  
| Project management  
| Market research  
| Pricing & marketing  
| Evaluation  
| Quality certification | Theories & Schools of management  
| Information economy  
| Psychology of the consumer  
| Management principles & techniques  
| Methods of forecasting  
| Principles of marketing  
| Techniques & tools of market research  
| Strategies and methods of marketing  
| Project management tools  
| Budgeting techniques  
| Performance evaluation: measurement techniques  
| Intellectual property rights |  
| Networking and storage technologies  
| Networking processors-routes, gateways, bridges etc.  
| Operating systems: Windows, UNIX, LINUX  
| Networking operating systems  
| Office automation  
| Networking topologies and protocols  
| Web site management  
| Digital document creation-files and formats  
| Preservation techniques-digital watermarking and digital signatures |  
| System for automation, LAN, Internet, Intranets, etc.  
| Setting up the system  
| Data conversion  
| Web site development and registration |  