ETD Development in Southern Africa: Challenges and Innovations

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ABSTRACT

A relatively small number of institutions in Southern Africa have started and implemented electronic theses and dissertations delivery. However, more institutions are planning to embark on ETD implementations and in South Africa a national initiative is underway. CHELSA, (Committee for Higher Education Libraries in South Africa) has agreed that ETD should be developed as a national project. Although some institutions have successfully implemented ETD's, including the DATAD (Database of African Theses and Dissertations) project, nationally there are still many challenges ahead. Currently, ETD projects are uncoordinated, run by different software, few institutions have expertise readily accessible, participation and progress are slow, uniformed policies are lacking, uniformed submission and retrieval systems need to be developed, and ongoing training opportunities need to be developed. This paper will explore institutional, social and policy issues with regard to ETD's, the University of the Western Cape (UWC) experience with ETD's and challenges and innovations in South African institutions.

1. INTRODUCTION

Reasons for implementing electronic theses and dissertations in Africa are no different from those of other countries or regions in the world. These include the need to enhance dissemination of information; the provision of access in a timely manner; and costs associated with managing and disseminating paper records. In Africa the higher education system is well established and research output over time has been considerable. However, very little of this output is published in traditional formats (paper), there is limited accessibility outside of countries of creation and even locally there are problems associated with access.

Spacial, financial and distribution issues are among the limitations that impact on access to print/paper materials. It therefore seems logical to investigate and take advantage of the alternatives which newer technologies and information delivery strategies offer. The open source movement is one such option. Through such means African universities hope to provide enhanced access to their research output; make such work available to the rest of the world; preserve the intellectual output of their scholars; make use of indexing and search capabilities provided by ETD software; reduce tasks required to manage such resources; effect financial efficiencies associated with managing and administering theses; and, facilitate access to different media formats associated with research output are some of the many options offered by the software applications available. These objectives are no different from those that exist in the international academic community.

Mutula (2004) states that "the question of local content has become a topical issue especially in international and regional forums and institutions, such as the Digital Opportunity Task Force for bridging the digital divide, World Summit on the Information Society (WSIS) and New Development for Partnership Development (NEPAD)". He continues to say that in Africa, local content development has been

hampered for various reasons. The development of digital libraries provides an important opportunity for African content available and accessible locally and to the international community.

2. COLLABORATIVE ETD EFFORTS

Several collaborative ETD efforts in Africa have taken place over the last couple of years. Some of these include the Database of African Theses and Dissertations (DATAD), the Adolescent Reproductive Health Network (ARHNe), and CODESRIA Documentation and Information Centre (CODICE) which are described below. Although these projects/programmes differ in scope and management, they all have a common aim, namely to support, develop and enhance access to research output through the dissemination of theses and dissertations.

2.1 DATAD

The Database of African Theses and Dissertations (DATAD) project, launched on 30th April 2003, seeks to improve the management and access to African scholarly work. Pioneering institutions of DATAD are: Addis Ababa University, Ethiopia; Makerere University, Uganda; University of Ghana, Ghana; University of Dar es Salaam, Tanzania; Universite Cheikh Anta Diop, Senegal; Eduardo Mondlane University, Mozambique; University of Zimbabwe, Zimbabwe; Yaounde I University, Cameroon, CODESRIA, Senegal, Ain Shams University, Egypt; and, Kenyatta University, Kenya. DATAD has now been accorded the status of being a programme and it is poised for expansion which will include access to full-text. Within the framework of the long term objectives DATAD will focus on expansion, sustainability, access, preservation, and copyright & intellectual property management. See (http://www.aau.org/datad/database).

2.2 The Adolescent Reproductive Health Network (ARHNe): Health System and Health Promotion Research in Eastern and Southern Africa

The Adolescent Reproductive Health Network (ARHNe): Health System and Health Promotion Research in Eastern and Southern Africa is a concerted action project funded by the European Commission. ARHNe is a research network that includes several on-going research programmes and projects. In addition to institutions in Southern and Eastern Africa some of ARHNe's18 partner institutions are located in Europe. All of these institutions are involved in researching and/or implementing programs targeting adolescent reproductive health and risk behaviours. The database provides a list of theses with hyperlinks to abstracts only. See http://www.nutrition.uio.no/ARHNe/

2.3 CODESRIA Documentation and Information Centre (CODICE),

Established in 1983, the CODESRIA Documentation and Information Centre (CODICE), collects, processes and disseminates information pertaining to the social sciences. It provides documentary support and information to CODESRIA research programmes, African researchers, African universities, research and training institutes as well as to African governments and their agencies. CODESRIA since 1988, through its programme of Small Grants for Thesis Writing, has given support to African scholars and students at several continental institutions and from various disciplines. Theses and dissertations sponsored by this fund have been deposited

with CODESRIA have been processed and are available through CODESRIA's website. See http://www.codesria.org/Documentation.htm

These databases are important tools for raising awareness about the availability of such resources. The next key steps should be the provision of information on access to the full-text versions or the provision of a link to the full-text.

3. ETD's in SOUTHERN AFRICAN UNIVERSITIES

While most ETD projects have been initiated by libraries of higher education institutions exceptions, such as those in Botswana and Namibia, exist. The following is an overview of ETD projects in selected Southern African countries. Details on policy, copyright, submission procedures and management of theses will also be provided.

3. 1 Zimbabwe, Namibia and Botswana

The University of Zimbabwe Library is one of DATAD's participating institutions. Investigations into ETD's began in 2003. Among the challenges highlighted were that there was no clearly documented set policy on copyright; some theses lacked an abstract; and, there was no clearly stated policy on submission procedures.

A register of theses and dissertations initiated by the National Archives of Namibia, is now the responsibility of the University of Namibia Library. The goal of this activity is to acquire and convert theses and dissertations into an electronic format and make them available for viewing and printing.

The University of Botswana, Department of History maintains a subject index and checklist of History and Archaeology dissertations and research essays submitted to the university. Bound typescript copies of dissertations and research essays are deposited in the Botswana Collection of the University of Botswana Library and in the Botswana National Archives, Gaborone.

3. 2 South Africa

Potchefstroom University of Christian Higher Education (PUCHE) maintained a Union Catalogue of Theses and Dissertations (UCTD) dating from 1918, the compilation of which stopped in 2002. Since 1985, Sabinet Online has hosted the database. UCTD contains approximately 85,000 bibliographic records of theses and dissertations at the masters and doctoral level submitted to universities in South Africa. Some records include abstracts. Since 1950, a 'Current and Completed Research Database', NEXUS, has been compiled and maintained by the National Research Foundation (NRF). Approximately 124,500 South African research projects are listed in NEXUS.

Development of full-text ETD projects in South Africa started in 1996. Generally these projects are initiated and managed by individual libraries. In some cases they are joint projects between the libraries and IT departments; or, between the library and faculties; or, between the library and offices responsible for student administration. ETD servers are hosted either by the library or the central IT department. Generally, IT departments are responsible for the maintenance of these servers. Of the 21 institutions of higher education in South Africa only 8 have implemented ETD projects.

These are:

Institution	System	Available	Access
North West University	None: link from catalogue	368	Unrestricted
Rhodes University	E-prints (post 2004), None: link from catalogue Pre-2004	80	Mostly restricted
University of the Free State	VT ETD-DB (NDLTD)	54	Unrestricted
University of Johannesburg	VT ETD-DB (NDLTD)	565	Unrestricted
University of Pretoria	VT ETD-DB (NDLTD)	1000+	Unrestricted
University of South Africa	VT ETD-DB (NDLTD)	300+	Unrestricted
University of the Western Cape	None-link from catalogue	50+	Unrestricted
University of the Witwatersrand,	VT ETD-DB (NDLTD)	30+	Mostly restricted

Five institutions use the VT ETD-DB (NDLTD) software. To date, two institutions do not use any specific software. Full-text links are provided either via the online catalogue and/or from a web page. One institution, Rhodes University is using E-prints post 2004. Access to full-text is mostly unrestricted, except at the University of the Witwatersrand and Rhodes University. Until recently, the ETD projects mentioned above were isolated initiatives with no national coordination. Consequently, there was little cooperation leading to a lack of uniform submission and retrieval systems; limited training in digital technologies; no compliance with OAI standards; restricted access policies; and, limited resource sharing.

For sometime, CHELSA (Committee of Higher Education Libraries of South Africa) has been discussing the need for collaboration. In May 2005, a proposal on a national ETD project was considered and CHELSA has decided to initiate an ETD national project. A committee of representatives from CHELSA, HESA (Vice-Chancellor's Association), National Research Foundation (NRF), National Library of South Africa and technical experts was established to take this project forward.

4. PLANNING FOR ELECTRONIC DELIVERY OF THESES AND DISSERTATIONS: THE UWC EXPERIENCE

In 2003, the UWC library identified 6 key strategic objectives, one of which was the building of a digital collection. A Library Digitisation Working Group (LDWG) was established to investigate the feasibility of this objective. During the period of the investigation, the Library was approach by the Registrar who was in the process of restructuring her departments. She indicated that the Registry needed the 3 staff members responsible for microfiche of completed theses. She was informed of the on-going investigation into digitalisation and it was agreed that Student Administration and the Library would work together on the project.

The Library identified the following as the major outputs for this project:

- Opportunities for electronic scholarly publishing for UWC academics and researchers;
- Enhanced access to UWC's research output;
- Development of software and processes that will enrich searching, retrieval and navigation of UWC publications;
- Infrastructure to support imaging projects and archiving of digital images; and,
- High-resolution digital imaging of manuscripts, audio-visual material, etc.

Among the objectives of the several meetings held by the LDWG were:

- Ascertaining the then current workflow procedures;
- Ascertaining the applicable rules and regulations;
- Formulating a strategy for digitization;
- Implementing interim measures; and
- Identifying the processes involved, submission, dissemination, archival, access.

The procedure for the submission and dissemination of theses pre-2005 is illustrated below:

Blue =Student responsibility	
Black = Lecturer responsibility	
Red = Student Administration Office Responsibility	
Green = Library Responsibility	

Student submits thesis (paper form)

Lecturer marks and sends approved thesis to Exam's office.

Student required to submit bound copies at Library

Student required to submit copy for Microfiche development at Exam's Office

Copies catalogued and taken up in Library collection

Microfiche Development

One copy held at Special Collection

Other copy held on open access shelves

Microfiche sent to Library for Inter Library Loans and
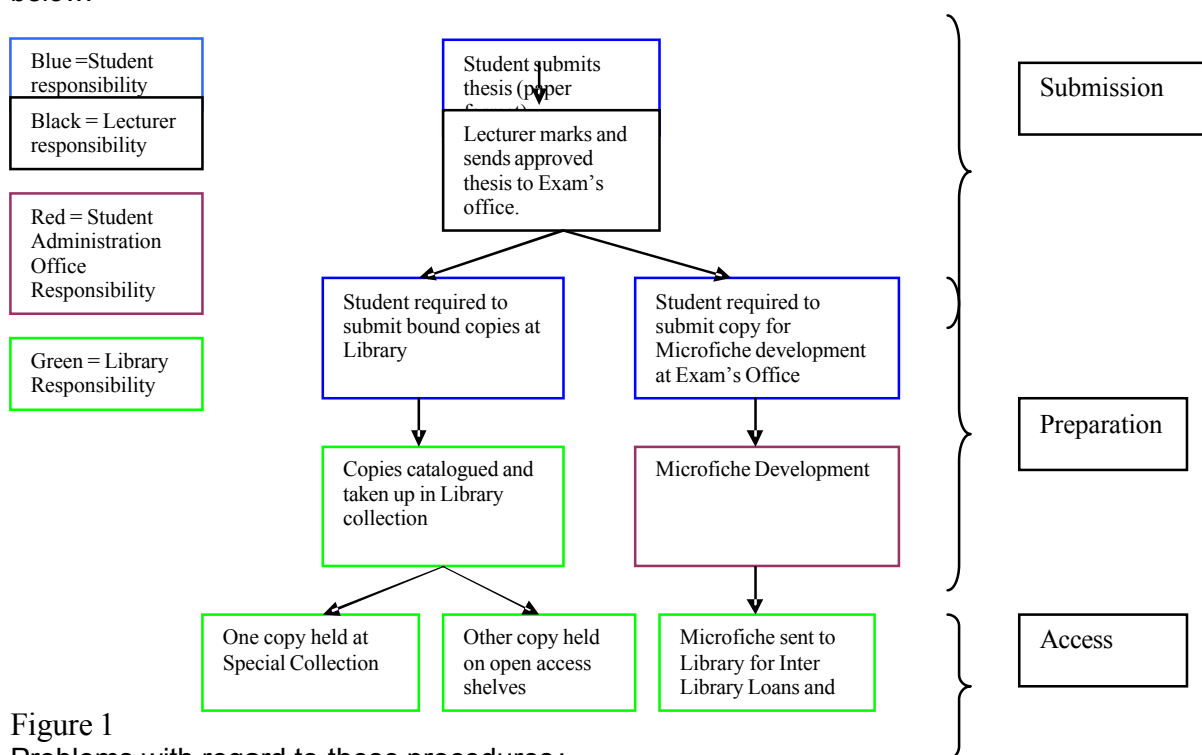
Submission

Preparation

Access

Figure 1

Problems with regard to these procedures:

- It was a cumbersome process as numerous offices handle theses before the final product is accessible;
- The student was required to submit multiple bound copies at his/her own expense;
- The research output was not immediately available as it took time for technical preparation before dissemination;
- Microfiche development is expensive and labour intensive;
- Microfiche technology not really supported anymore, or supported at great expense;
- Limited global access to research information as only bibliographical information is available online;
- Full-text documents are supplied on request, by means of a lengthy and time-consuming method; and that
- No digital repository of research output.

Once discussions were concluded, the LDWG drafted a proposal that was submitted to the Senate Library Committee, who supported it and recommended it to the Senate Executive committee for final approval by Senate. Among the proposals made by the library was that the current method of submission and dissemination of

theses be changed. In order to ensure the smooth transition to a fully-fledged ETD repository the Library proposed a two-phase process:

- **Two-year transitional phase (2004-2005):**
  print dissertations are scanned and archived. During this period the submission of electronic dissertations by students is optional. The Student Administration Office has already committed, in principle, to scan items.

- **Final implementation phase (from 2006 onwards):**
  a system is implemented whereby all students submit their theses and dissertations in electronic format.
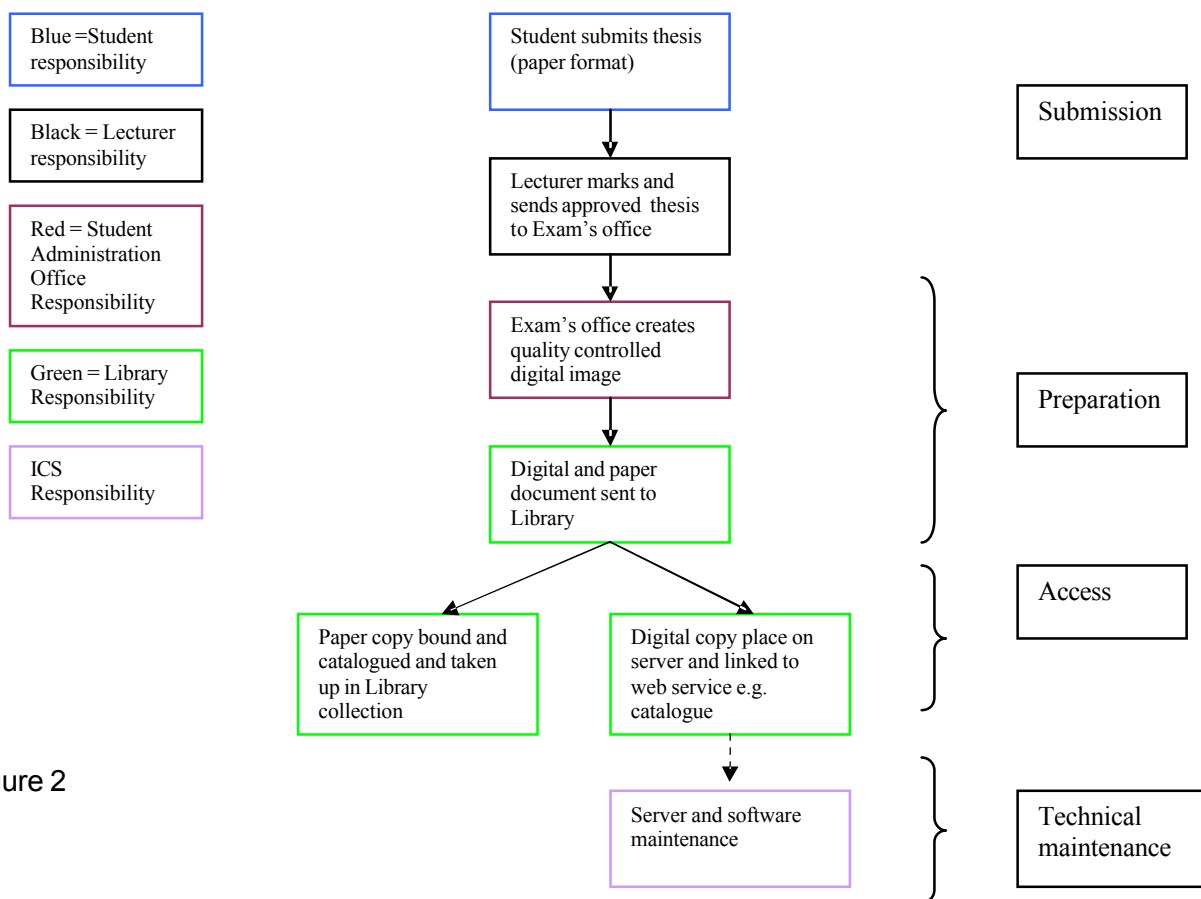
The proposed interim procedures are:

Legend	Flowchart	Phase
Blue = Student responsibility	Student submits thesis (paper format)	Submission
Black = Lecturer responsibility	Lecturer marks and sends approved thesis to Exam's office	
Red = Student Administration Office Responsibility	Exam's office creates quality controlled digital image	Preparation
Green = Library Responsibility	Digital and paper document sent to Library	
ICS Responsibility	Paper copy bound and catalogued and taken up in Library collection / Digital copy place on server and linked to web service e.g. catalogue	Access
	Server and software maintenance	Technical maintenance

Figure 2

The following issues were identified immediately impacting on the transitional phase*:*
- Resources required for the maintenance of the document scanner;
- Quality control of the scanned document: Scanned document will have to be checked to ensure that the scanning and conversion process was completed successfully;
- Hardware requirements such as available server space, maintenance and backup systems;
- Software requirements such as continual upgrade of digital format (e.g. Adobe PDF) to conform to international standards and newer versions of software and new software developments;
- Network requirements in order to ensure stability as local and incoming network traffic increases;
- Some theses may have embargos placed on it for various reasons;

- Access policies on whether or not to provide open access to digital full-text theses and dissertations;
- Staff training requirements;
- Retrospective digitisation of print theses;
- Library staff - responsibilities and skills development;
- Web development;
- ICS – mutual understanding and agreement, assistance with interface developments, additional server space, web development; and
- Identification of all stakeholders

As part of the implementation process at UWC it was recommended that an ETD Task Group be formed. This group would be tasked with investigating and developing proposed workflow and submission procedures. The ETD Task Group would also be required among other things to submit proposals pertaining to funding; human resource capacity and requirements; as well as policies and procedures to the relevant institutional and governing bodies. The proposed task group would consist of representatives from the following offices and departments: UWC Library, Research and Development, Information and Communication Services, Postgraduate Project, Academic Planning, Student Administration, and all faculties

To date two workshops aimed at informing stakeholders of the ETD project have been held. Among the objectives of these workshops are creating an awareness of ETD's and the benefits thereof, enhancing awareness of other related existing projects (Enterprise Architecture), establishing agreements on the project, and, providing opportunities to ask questions and raise issues.

The lessons learned so far by UWC are probably also not very different from those experienced by other institutions. What is very clear is that there are different approaches, which is chosen will primarily depend on local environment. What will work for one institution would not necessarily work at another. It is therefore important when embarking on an ETD project that a realistic exploration of the following be pursued:
- investigation and analysis of all the relevant processes;
- a comprehensive research of all issues associated with ETD establishment;
- the early identification of the responsibilities of all role players;
- the establishment of collaborative planning parameters;
- knowledge of institutional development; and
- an awareness of national and international initiatives.

I am pleased to report that the UWC's ETD transitional phase is progressing very well. The ETD Task Group will now address the policy issues; rule changes; software options; and, submission procedures. UWC will also fully participate in the CHELSA initiative and work closely with the University's Enterprise Architecture.

5. CHALLENGES AND INNOVATIONS

A number of challenges face African institutions as they attempt to develop and implement suitable and sustainable ETD projects. In an introduction to a recent article, Lor (2005) wrote the following: "Rapid growth in the production of digital information media worldwide poses enormous challenges to heritage institutions

such a national, research and repository libraries. If digital media cannot be preserved, part of the African heritage is being lost." It is therefore incumbent upon institutions in Africa that they ensure that not only is African generated knowledge available but that it is also preserved for posterity.

Some of the other key challenges are related to institutional, social, technical and policy issues. Based on the current projects and the UWC experience the following are important questions and issues that institutions intending to establish ETD services should consider:

- Technical factors (software, infrastructure, security, backup/storage, systems interoperability and compliance, mark-up language);
- Digital preservation (acceptable and supported file formats, migration, refreshing, emulation);
- Intellectual property and copyright (awareness of ceded rights, copyright control, embargoes, plagiarism);
- Submission processes (workflow, rules and regulations, physical processes involved, quality control);
- Uploading processes (quality checks, method, interface development, file naming conventions);
- Descriptive metadata (responsibility, standards, harvesting);
- Project management (overall responsibility, future developments, continual assessments, funding, human resources, management information); and
- Capacity building (long-term sustainability, training, resource sharing, collaborative efforts).

In a number of African institutions innovative programs are being developed and implemented to address many of these challenges. These include:

- IMARK (Information Management Resource Kit), Digitisation and Digital Libraries Module. This module offers a series of interactive lessons covering workflows, processes, technologies and skills involved in the creation, management and distribution of digital libraries. The module is co-published by the Food and Agriculture Organization of the United National (FAO) and the United National Educational, Scientific and Cultural Organization (UNESCO).
- DATAD (see page 2) provides an African example of collaboration and sustainability
- Digital Imaging South Africa (DISA) is a non-profit initiative for cooperation among research libraries and archives in South Africa. The aim of DISA is to make Southern African material of high socio-political interest, otherwise be difficult to locate and use, accessible to scholars and researchers worldwide. In addition, DISA at the same time will develop knowledge and expertise in digital imaging technology for library and archival communities in the region. The project is sponsored by the Andrew Mellon Foundation. See http://disa.nu.ac.za

6. CONCLUSION

The collaborative efforts underway are positive developments and will go a long way to increasing the visibility of Africa's research output to a world audience. Hopefully through these efforts, the necessary capacity will be developed in institutions so that they can take full responsibility for the electronic publication of their research output.

Through such initiatives African institutions of higher education will contribute to creating content and thereby becoming less dependent on external sources to provide access to the output of African researchers. The use of ETD's will impact positively on the provision of local, national and international access to the research output of African scholars. Through ETD African libraries can contribute to bridging the digital divide presently affecting access of and to African scholarship. ETD will also assist in the delivery of African knowledge to the world. ETD will also facilitate the development of new models of scholarly publication, the improvement of skills, foster capacity building and enhance access to valuable research material. ETD will place African scholarship at a level that will be compatible with international standards in this field.

7. REFERENCES

The Adolescent Reproductive Health Network (ARHNe): Health System and Health Promotion Research in Eastern and Southern Africa:
http://www.nutrition.uio.no/ARHNe/

Association of African Universities: Database of African Theses and Dissertations (DATAD). http://www.aau.org/datad/backgrd.htm

DATAD Country report; Zimbabwe Paper presented at the Datad workshop Addis Ababa 11-12 June 2002.

Council for the Development of Social science Research in Africa: CODESRIA Documentation and Information Centre (CODICE)
http://www.codesria.org/Documentation.htm

Lor, Peter Johan (2005). Preserving African digital resources: is there a role for repository libraries? Library Management, Vol. 26, No, 1/2, p 63-72

Mutula, Stephen (2004). IT Diffusion in Sub-Saharan Africa: implications for developing and managing digital libraries. New Library World, Vol. 105, No, 1202/1203, p281-289

Register of Namibian Theses: http://greenstone.unam.na/gsdl/cgi-bin/library?site=localhost&a=p&p=about&c=theses&ct=1&qto=2&l=en&w=utf-8

Report to the Committee of Higher Education Libraries of South Africa. 2004

Ubogo, Felix N (2002). ETDs in South Africa: Current Status, Paper presented at the Fifth International Symposium on Electronic Theses and Dissertations, Brigham Young University, Provo, Utah. May 30, 31 and June1, 2002.

University of Botswana History Department; Student research and publications
http://ubh.tripod.com/ac/studrp.htm

University of the Western Cape, Library Services: Proposal for a Digitisation Project at UWC. 2004.