

The development and management of electronic theses and dissertations (ETDs) at the University of Khartoum

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Abstract

This paper investigated the status of the electronic theses and dissertations (ETDs) programme development and management at the University of Khartoum (UofK) in Sudan. Explored aspects such as deposit policy, workflow, the theses and dissertations retrospective digitization project progress, metadata and software platform used, dissemination and access mode employed, and copyright issues. The study adopted a qualitative approach involving the case study method. A semi-structured interview was used for the purpose of data collection. Relevant documents and reports pertaining to the ETD programme development at the University were obtained and analyzed, in addition to observation, and investigation of the ETD collection at the University's institutional repository. The paper revealed the various strengths and weaknesses of the ETD programme at the University such as the availability of the collection via the institutional repository of the University as either abstract or full text, and the lack of coordination among the stakeholders of the programme. Highlighted some of the opportunities and threats of the programme and finally came up with some conclusions and recommendations that will enhance the production and management of ETDs at the University of Khartoum.

Keywords: University of Khartoum ETD programme, University of Khartoum repository, Khartoumspace, University of Khartoum Graduate College

Introduction

The University of Khartoum (UofK) is the oldest and largest university in Sudan. It was established in the year 1902 as the Gordon Memorial College and later renamed the University of Khartoum in 1954. The U of K offers academic programmes at both undergraduate and

postgraduate levels. Postgraduate studies began at the university in 1954 by a postgraduate diploma in Gynecology and Obstetrics. The first Masters by research programme was offered in 1958 at the Faculty of Agriculture. The College of Graduate Studies was established in the year 1973. Before that date, postgraduate programs were administered by the Postgraduate Studies Committee set up in the year 1967. The objectives of the graduate college are:

- i. To formulate and promote University policy in the field of post-graduate studies and training on research.
- ii. To promote and coordinate interdisciplinary research in the field of post-graduate studies and to co-operate with research units and other institutions outside the university.
- iii. To be in charge of every institute, station or unit assigned to it by the University Senate or Council. (University of Khartoum, Graduate College, 2019)

The Graduate College set up in the year 2003 four specialized boards for the following fields of knowledge: Humanities and Educational Studies, Basic and Engineering Studies, Medical and Health Studies, and Agricultural and Veterinary Studies. The College now offers about 310 different programmes in collaboration with 19 faculties and 12 institutes affiliated to the University. There are now more than 7000 registered students and it has already offered graduate degrees (Postgraduate Diplomas, Masters, and PhDs) to more than 20,000 graduate students since its inception. The Graduate College of the University of Khartoum plays a vital role in the process of training of the staff of over 100 government and private universities and colleges in Sudan. Before the emergence of the ETD concept, postgraduate students were required to submit two print copies of their theses to the Graduate College. One copy was kept at the Graduate College library whereas the other one was sent as legal deposit to the University of Khartoum Main Library to be kept in a special collection of theses and dissertations.

This study aimed to investigate the development, management and status of implementing electronic theses and dissertations (ETDs) programme at the University of Khartoum.

Literature Review

Many authors stressed the advantages and benefits of ETDs. Bandra outlined the following advantages:

- They improve graduate education by allowing students to produce electronic documents, use digital libraries and understand issues in publishing;
- They increase the availability of student research for scholars and preserve it electronically;
- They lower the cost of submitting and handling theses and dissertations;
- They empower universities to unlock their information resources; and

- They advance digital library technology and empower students to convey a richer message by using multimedia and hypermedia technologies. (Bandra, 2002, as cited in Hirwade, 2011).

Coles and Porter (2003) pointed out that electronic theses in a globally networked environment have many advantages over their print-on-paper origins including ease of use for remote users, discoverability from free search services and capacity to integrate rich multimedia. Vijayakumar, Murthy, and Khan (2005) stressed that ETDs allow adventurous students to express their research results in more creative and flexible ways that would not be possible if they were limited to paper based output, and that born digital theses may include audio and visual material and may not even be in a traditional linear format.

Several studies discussed ETDs dissemination and access modes, embargoes, and copyright issues. McMillan illustrated three levels of access types namely:

- **Unrestricted Access:** Readers do not encounter any restrictions that limit access to the ETDs and that libraries providing ETDs with unlimited access include bibliographic data in their OPACs as well as through a variety of other access points, including Internet databases.
- **Partially Restricted Access:** Readers can be limited to the author's university. An advantage of this type of access is that everyone associated with the originating university could have access from a variety of locations both inside and outside the library at all hours of the day, These readers are typically recognized as members of the author's university by their IP addresses or their university-assigned user IDs.
- **Fully Restricted Access:** There are some conditions that require theses and dissertations be entirely withheld from public access. (McMillan, 2002)

Henry (2014) pointed out that numerous issues could cause an institution to restrict access to an ETD. These mainly include publishing concerns, the inclusion of sensitive data in an ETD, research sponsor restrictions, and patent concerns. She further indicated that access restrictions can be applied to an entire work or only parts of it. She then elaborated on embargoes and indicated that they are one form of access restriction whereby a thesis or parts of it are not available for a specified period. She also pointed out that in addition to embargoes, redactions can be used to conceal specific information in a thesis even though the thesis is not embargoed. According to her, Redactions involve blocking out sections of the document that contain information that cannot be released. She concluded that institutions and funding agencies are increasingly requiring open access to publications produced by their researchers and faculty and that open access thesis mandates started to appear in 2008 and have been increasing ever since. Hawkins, Kimball, and Ives (2013), on the other hand, criticized mandatory ETD policies as coercive and recommended that ETD policies should be provided on a prominently placed, unbiased website and that such a website should contain clear, unbiased definitions of at least the following terms: copyright, copyright holder, license, Open

Access, and embargo. Rasuli, Solaimani, and Alipour–Hafezi (2013) stressed that the ETD content providers' moral, ethical, and economic rights should be clear, and issues relating to copyright such as disclaimers and terms of use must be published online. They added that policies to address copyright infringement, plagiarism, and embargo in ETD programmes should be explicit and transparent. Perry and Callan (2006) ascertained that the most pressing ETD issue is dealing with copyright in the submitted thesis that may be held by third parties. They further stressed that copyright is a global problem that needs to be addressed by every institution that accepts born digital or digitized ETD submissions.

A number of authors studied the opinions of institutions, scholars, and academic about ETDs policies. Lippincott and Lynch (2010) surveyed a number of institutions in the USA and found that 87% of their study sample institutions had a policy allowing students to request a limited–time embargo whereas 10% had a policy allowing students to request a permanent embargo. They concluded that this issue has affected the adoption of ETDs in the USA. Vijayakumar, Murthy, and Khan (2005) surveyed Indian scholars' attitudes and opinions on copyright issues related to ETDs and noted that a considerable number of them expressed apprehensions to provide global online access to their ETDs. Vijayakumar et al stressed that issues such as enough protections on copyright, digital management rights, repositories' rights and responsibilities, digital preservation, access and distribution, Metadata, and legal responsibilities ...etc need to be thoroughly worked out for protecting the scholar's contributions.

The issue of retrospective digitization has also been discussed in the literature. Perry and Callan (2006) pointed out that the main problem with retroactively distributing electronic versions of paper to ETDs is the difficulty in getting the permission of the author. According to them, this permission seeking would be prohibitively expensive, and one option is to take a risk of copyright infringement actions and engage in the digitization and digital archiving. Piorun (2008) argued that locally digitizing dissertations or other scholarly works for inclusion in institutional repositories could be cost effective, especially if small, defined projects are chosen. She pointed out that challenges include workflow, cost, policy development, and copyright permissions. Baro and Otiodo (2014), on the other hand, pointed out that digitization of theses and dissertations is an answer to making local research accessible globally although it needs a lot of finance for procurement of facilities and training of staff.

Other important issues concerning ETDs have been discussed in the literature. Copeland and Penman (2004) highlighted a number of concerns regarding the establishing of ETD repositories. These concerns include authentication, long–term preservation of digitally born ETDs, and the level of IT skills that is required to produce an ETD on the part of students and supervisors in case of self–archiving. Satyanarayana and Babu (2007) discussed barriers to the implementation of ETDs in India and proposed a model plan to speed up the process. They mentioned the following issues as possible causes for the slow progress in

ETDs in India: high volume of research output, Intellectual property issues, concerns with plagiarism, quality of research produced in India, concern with long-term preservation, limited support from librarians, lack of trained staff, limited number of training programmes, and limited number of access aggregators.

Methodology

This study adopted a descriptive-analytical approach and employed the case study method to explore the development and status of implementation of the ETD programme at the University of Khartoum. For the purpose of data collection, a semi-structured interview was conducted with those responsible for implementing the programme. Relevant documents and reports pertaining to the ETD programme development at the university were also obtained and analyzed, in addition to an investigation of the ETD collection at the University's institutional repository. The collected data was then qualitatively analyzed in order to arrive at the study results and conclusions.

Results and Discussion

The University of Khartoum administration set up the Electronic Library Technical Committee in 2003 to be responsible for the Digital Library of the University. One of the major recommendations of this committee was the designing of an electronic database of the theses and dissertations of the Graduate College of the University. The technical committee was under the supervision of the Director of the then ICT Centre of the university - now the Administration of Information Technology and Networks- with a number of the University Library staff as members. The committee set two main phases for implementing the ETD project, namely:

- i. Loading of all theses and dissertations submitted in electronic form starting from the year 2003 onwards.
- ii. Retrospective digitization of all theses and dissertations submitted in paper form before the year 2003. The UofK library houses more than 12000 copies of theses and dissertations in paper form, which are catalogued and whose bibliographic data is available to users in a special collection of TDs.

Submission Procedure

According to the Guide to Theses and Dissertations Preparation and Submission (2002) issued by the University of Khartoum Graduate College, Students should submit an electronic copy of the final version of their theses and dissertations on a CD, along with two print copies. The Graduate College Library will keep one of the print copies and send the other one to the Main Library of the University of Khartoum as legal deposit, where they will be kept in a special collection of theses and dissertations.

The electronic copy on the CD should include the following three files,

- The complete work in PDF including the title page,
- The abstract in both Arabic and English languages in a Word .doc file; and
- The title page in a Word .doc file.

The University ETD Office located at the Graduate College, which consisted of only one staff member, initially carried out mounting of the ETD onto the database. This responsibility was subsequently transferred to the Administration of Information Technology and Networks, the same body that is now responsible for managing the university institutional repository.

Retrospective Digitization

Retrospective digitization of the old paper TDs is carried out by the Digitization Unit, which was established as part of the University's Electronic Library in the year 2010. The retrospective digitization project started in early 2015. The Digitization Unit is responsible for digitization of all types of sources including rare books and manuscripts. This unit contains the following assets:

- Three PCs
- Three scanners – hp scan jet 5590
- One scanner for manuscripts
- One printer

The Unit has been allocated a separate budget to meet the different expenses of digitization, including incentives for the working staff. The staff is composed of two Assistant Librarians and one computer assistant with a diploma in computer science. They scan the paper TDs and then convert them to PDF. The Administration of Information Technology and Networks would later collect these digitized copies in order to load them into the ETD database. The paper TDs were divided into four chronological phases for retrospective digitization as follows:

- i. Phase1: Digitization of all theses and dissertations produced during 1962–1972.
- ii. Phase2: Digitization of all theses and dissertations produced during 1973– 83.
- iii. Phase3: Digitization of all theses and dissertations produced during 1984–1992.
- iv. Phase4: Digitization of all theses and dissertations produced during 1993–2002.

The first three phases have been accomplished, whereas Phase4 started in early 2019 and is in progress. The collection of this phase contains the largest number of paper TDs. It is expected to take a longer period to digitize compared to the three previous phases. About 5000 TDs have been digitized in the first three phases of the project out of about 12000 paper TDs.

Metadata and Software Platform

A number of problems confronted the ETD project at the University of Khartoum when it started in 2003. One of these problems was deciding on the metadata elements to describe and make available the ETDs held by the database. This problem occurred because of the

different backgrounds of the Electronic Library Committee members responsible for setting up the database. However, the committee finally agreed on the following metadata elements: Title, Author, Uniform Resource Number (URN), Degree, Faculty, Department, Supervisor, Co-supervisor, External Supervisor, External Examiner, Internal Examiner1, Internal Examiner2, Date, Keywords, English Abstract, Arabic Abstract, and Degree Year.

Another early problem faced by the ETDs programme at the University of Khartoum was the frequent migration from one software platform to another. At the beginning of the ETD project, the database was mounted onto the open source library automation software Php-MyLibrary. The database was later migrated to an in house designed application based on the open-source PhpMagic. Finally, a decision was made in the year 2013 to integrate the ETD database into the University's newly set up digital institutional repository, which implements the widely used DSpace platform. DSpace is an Open Source Software characterized by a number of features such as granularity, multi-format support, customizable interface, community/sub-community-based collection architecture, import and export features, Persistent Identifiers Handle System, Open URL Support, search engine, and generation of statistical reports. It also adheres to standards such as compliance with Open Archives Initiative Protocol for Metadata Harvesting (OAIPMH), and support to fully qualified Dublin Core Metadata Initiative (DCMI), (Mishra, Vijaiand, Noufal, & Shukla, 2007).

The ETD collection at the repository consists of 10336 items as of August 2019 (See Fig1 below).

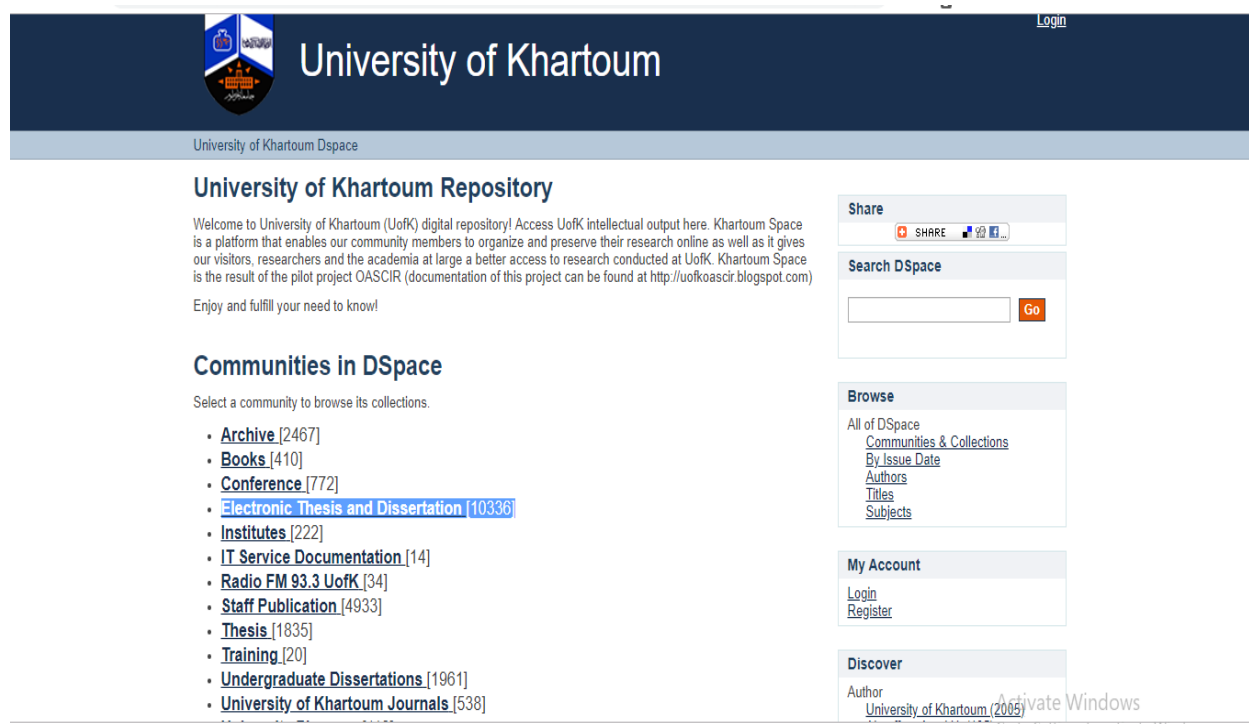


Figure1:

A screenshot of the UofK digital repository homepage showing the ETD collection available as a community within the repository at: <http://khartoumspace.uofk.edu>

Access and Copyright Issues

The ETD database can be accessed either from within the University campus through the University LAN, or via the internet from anywhere, locally and internationally, through the University of Khartoum digital repository (Khartoumspace) at khartoumspace.uofk.edu . A study by Abdelrahman (2017) showed that the ETDs were the most frequently used collection by the UofK digital repository users.

The Digital Content Committee with support from the UofK Vice Chancellor took the following decisions concerning the copyrights of the ETD collection of the University, as part of the University Institutional Repository policies:

- All theses and dissertations produced prior to the year 1962 up to the year 2002 should be freely accessible in full text without any restrictions or permissions.
- All theses and dissertation produced after the year 2002 will undergo an embargo period of five years after which the full text of the thesis or dissertation will be accessible. Within this embargo period, only the metadata and abstract are available. Some of the ETDs that have passed the embargo period may be restricted to metadata and abstract access only while the full text is password protected and users may access it after getting authorization from the repository administration.

The mandatory access policies faced some problems. There were reported cases of some copyright holders – PhD graduates – who officially complained about their dissertations being accessed full text over the internet via the University of Khartoum repository without their permission or consent.

Opportunities and Threats

A number of opportunities and threats surround the ETD programme at the University of Khartoum. Opportunities may be derived from the positive development of the telecommunications and internet infrastructure and the steady expansion of higher education in the country. Threats include lack of funds due to insufficient state financial support to the university, in addition to the continuous turnover by the library and repository trained staff in search of better job opportunities.

Conclusions

The ETD collection is accessible to users from within the University of Khartoum local network or from anywhere with internet connection via the University of Khartoum website. The ETD collection of the UofK institutional repository is the most heavily used collection by the repository users. This highlights the fact that the database is beneficial to those users and that it contributes to the visibility and accessibility of its content of ETDs.

The University administration introduced mandatory policies on submission of

electronic format of TDs along with the paper format, as well as policies on embargo and access issues. There is need to introduce an updated version of the Guide to Theses and Dissertations Preparation and Submission issued by the Graduate College to include orientation on copyright, embargoes, and permissions issues.

Some of the old paper copies of the theses and dissertations undergoing retrospective digitization are too fragile and have been affected by environmental factors. This has had a negative impact on the quality of the produced ETDs.

The scanners and software used for digitizing the paper copies of the theses and dissertations are outdated and there is lack of scheduled maintenance for the digitization equipment.

There is an apparent lack of coordination among the stakeholders of the ETD programme, namely, the University Library administration, the Administration of Information Technology and Networks, and the Graduate College. This lack of coordination is reflected in the amount of backlog in the ETD workflow, among other things. A considerable proportion of born digital and digitized theses and dissertations are waiting to be processed and mounted onto the digital repository so they can be accessible by researchers and graduate students.

The retrospective digitization project is lagging behind and needs to have a strict timeline and deliverables. Less than 50% of the total number of paper TDs has been digitized so far in a period of almost five years since the launch of the project.

The University Library should have more involvement in the different aspects of the ETD programme, including the cataloguing, indexing of the ETDs, and uploading them onto the institutional repository.

The University of Khartoum ETD collection is not part of any local ETD networks. This is due to the lack of such active and functioning local networks, though there are unsuccessful attempts to establish such networks. These include the Sudanese Virtual Library (SUVL) and The Sudanese Academic Libraries Consortium (SALC).

The ETD collection is not part of any regional ETD network. This study recommends that the University of Khartoum repository integrate its ETD collection with the Database of African Theses and Dissertations (DATAD), a regional database of theses and dissertations administered by the Association of African Universities (AAU), taking into consideration the fact that the University of Khartoum is a full member of this organization. This integration will contribute to wider visibility and accessibility to the UofK ETDs collection.

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