Steering and strengthening knowledge economy through Open Access initiatives: Case of Zimbabwe

By

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The twenty first century has seen an accelerated development in the activities of library consortia in Africa. The e-revolution has precipitated the transformation of higher education (HE) through ushering in new paradigms with regards to how information / knowledge is generated, managed and shared. It will examine Open Access in Zimbabwe with regards to generation, promotion and coordination to realise the ideals of a knowledge economy. This paper will explore the extent to which open access has been adopted in Zimbabwe's HE institutions. It will also examine the extent of use of information and communication technologies (ICTs) in widening access to scholarly communication. The writers will examine the roles of library consortia, government and research networks in the open access dispensation. It will explore the challenges and opportunities emanating from open access. The paper will examine the extent to which academic institutions have adopted institutional repositories to promote access to e-content. The paper will examine challenges relating to intellectual property rights, for example, licensing and access to open educational resources. The paper will also explore how library consortia can derive benefits from open access. The paper will examine how Open Access Initiatives can help contribute to the knowledge economy.

Key words: *open access; knowledge coordination and local e-content; digital literacy*

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Introduction

The teaching, learning and research landscape in Zimbabwe's Higher and Tertiary education is experiencing seismic transition due to innovative disruptions induced by the proliferation and ICTs and the need to maintain high standards . Emerging technologies are making it possible for Universities in Zimbabwe to capture and share scholarly content through ETD platforms. Increased demand for Higher education coupled with adaption of new budding technologies is driving development in Higher Education. These institutions are managing technological impermanence and improving quality of service through engaging and adapting creative and innovative technology-centric developments, for example, ICT's, open access, open source and digital resource sharing. Access to scholarly communication is central to realising the vision of providing high information services timeously and hence the need to invest in robust and efficient information and communication infrastructure.

The ubiquitous nature of ICTs has enabled academic libraries to develop digital platforms for end users, content and the public to connect each other in search of knowledge. Such platforms enable easier **accessibility and discoverability** of ETD content. The endorsement of Open Access policies by members of the Zimbabwe University Library Consortium (ZULC) has given credence to the importance of the Open Access Initiatives and accessibility of ETDs. The development marks a victorious start in the battle to conquer knowledge frontiers and reposition the country in the global information / knowledge landscape. Singh (2015) describes ETDs as rich and unique sources of information "…untapped and under-utilised asset…"

Literature Review

The OA and ETDs movement would have been inapprehensible without ICTs. The ubitiquos and insidious nature of ICTs has led to the development of academic library consortia, e-content production and licensing, resource sharing, digital repositories and preservation. Ranga (2015) states that ICTs and consequent convergence of technology has given incredible advantage to the development of scholarly communication as evidenced by the proliferation of e-content, e-publishing, e-communication and e-content portals. The author concedes that libraries are central in widening and deepening access to scholarly communication and supporting the evolution of the knowledge economy. Academic institutions have adopted Open Access Initiatives (OAI) and Institutional Repositories (IRs) to democratise and leverage institutional intellectual content for the benefit of teaching,

research and learning. Copeland (2008) states that globally there are frantic efforts to promote "open access" as evidenced by the thrust towards IRs providing access to ETDs.

In Zimbabwe the principal shape of OA expression is the Institutional Repository (IR), followed by the OA journal (Nyambi, 2010). The IR wave has also swept through Zimbabwe academic landscape with all fifteen (15) universities having developed one using Free Open Source Software such as DSpace and Greenstone. Academic libraries are taking advantage of the proliferation of modern technologies to leverage their content as strategy to contribute towards realisation of institutional goals as well as enhancing visibility. This has seen institutions developing ETD repositories. ETD refers to a master's thesis or doctoral dissertation that is archived and circulated electronically rather than in print and bound format (Goodfellow, 2009). Easier and convenient access to scientific information will ultimately help to deepen and widen   access to information.

Open access as a publishing philosophy dates back to the last decade of the twentieth century. Frustration over ever escalating publisher prices and stringent terms combined with expanding digital distribution capabilities led to a multifaceted strategy. It includes new business models, institutional policies, national and granting agency requirements, self publishing and author retention of rights among others. But open access has not displaced the publisher monopoly (Chan, 2004). Scholars want their work to be more broadly read, but also must publish in high impact journals and with prestigious publishers in order to advance their careers. The beginning of the   Open access initiative is attributed to the continued phenomenal increase in the cost of subscription to scholarly journals especially in science and medicine *vis-à-vis* diminishing library budgets thus rendering libraries   incapable of satisfying the   information demands of users.

The market share of monopoly capitalism has seen 50% of scholarly publications being controlled by a group of five publishers thus making it difficult for libraries, researchers and scientists failing to meet subscriptions to the scholarly literature they needed for research and teaching (Chan, 2004). Upon realising this unfair global knowledge divide, Africa and the Global South have come together to push for equitable production and sharing of information on the global village hence the promulgation of the Dakar Declaration on Open Access in April 2016 (CODESRIA 2016). Macdonald (2015) argues that predatory, oligopolistic and monopolistic tendencies in the publishing industry are counter-productive to scientists and

researchers who need to advance knowledge. This is why ETDs have been welcomed and now deeply rooted in the scholarly ambience of academic institutions in Zimbabwe.

There is a sharp contrast between developed and developing countries with regards to the knowledge economy, for example, the former has a rich networked information/knowledge economy characterised by a robust ICT Infrastructure, high volumes of knowledge generation, networking and use, while the latter has an emaciated information economy consisting of a high number of consumers or downloaders relying on the core to satisfy information needs (Benkler, 2006).

Furthermore Africa is affected by the neo-colonial brain drain which has seen scholars migrating to the west where and they end up publishing works with foreign universities leaving Africa with a low publishing of scholarly communication(World Bank , 2005). OA initiatives provides Zimbabwe and rest of Africa with an opportunity to transform the unfavourable situation through encouraging more publications through inter-institutional and inter discipline collaborations to produce more relevant intellectual output.

"There is no way we can succeed in the eradication of poverty if the developing world is not part of knowledge creation, its dissemination and utilisation to promote innovation. Higher Education is a critical factor in making this possible and must be part of any development strategy" Doctor Mamphela Ramphele(2000)

The dialectical relationship between publisher and researcher or scholars has provided a fertile ground to critique and change exploitative models of publishing so that scientists and researchers will have affordable and sustainable access to their content (Macdonald, 2015). Furthermore, the author notes that as research become more data intensive, a scholar's ability to store, access and share primary data will be crucial to the advancement of scholarship.

Cayabyab (2015) states that the OA initiative has opened the doors for the development of ETD repositories. Such technologies are characterised by alternative models of submission, for example, mediated and self submission. ZULC members have taken advantage of technological development to establish ETDs that are accessible from the internet. Ferras -Fernandez (2013) argue that from a webometrics and infometrics perspective, open access ETDs have more citation counts and impact than those that are pass word protected. This gives credence to the viability of the OA initiatives with regards to promoting access to scholarly communication in academic institutions. Organisations

involved in institutional web ranking and altmetrics consider IRs and openness as they contribute significantly in the scoring for institutional web ranking. The OA dispensation has resulted in the proliferation of online self- publishing and self- archiving platforms thus democratising publishing and access to content.

Kusekwa and Mushawani (2014) opine that the Open Access culture has strongly gripped academic institutions in Zimbabwe as evidenced by the proliferation of Institutional Repositories (IRs) and ETDs. The adaptation of ICTs has helped to leverage intellectual capital through Open Access platforms. Library consortia are the vanguard in the Open Access initiative in Zimbabwe as evidenced by the adaptation and use of Free Open Source Software (FOSS), IRs, training workshops, OA policies, knowledge management and increased use of knowledge discovery tools to access e-resources. Technology has helped library consortia with cost effective ways of providing and sustaining quality library services and access to TDs. Open Access initiative is enabling academic libraries to overcome the restrictive barriers to access scholarly and scientific journals imposed by profit driven commercial publishing houses via subscription fees, license fees or pay-per-view fees. Open access initiative is premised on the notion that all digital scholarly communication should be available free of charge and free from the fetters of licensing and copyright.

" ... free availability of literature on the public internet, permitting any users to read, download, copy, distribute , print , search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, , use them for any other lawful purposes, without financial , legal and technical barriers, other than those inseparable from gaining access to the internet…" Budapest Open Access Initiative (BOAI, 2012).

Furthermore OA initiative should be analysed in the context of copyright laws with reference to public domain works. Intellectual Property Rights and copyright should be interpreted in the context of utilitarian and natural rights philosophies (Sheuefen, 2014).The former views intellectual property as a product by society and for the benefit of society, while the latter posit that an individual has a natural right to benefit from his or her labour hence the need for copyright (Eger, T. and Sheufen, Mark (2012), in Scheufen, Mark The ability to tackle or reconcile copyright and OA interests in the globalised knowledge age is critical for . There are variations with regards to how countries regulate public domain works, for example, some laws are explicit while others are not. Throughout the world there are specific laws enacted by governments to protect authors' copyrighted works, for example, the Copyright

and Neighbouring Rights Act in Zimbabwe (2000). However, people should be educated that publishing in open access journals or platforms should not be misinterpreted for freedom from copyright protection because such articles still fall within the domain of legal protection. Generally, copyright persist for fifty years (50) in Africa and Asia and seventy (70) years in Europe and United States of America (Public Domain Review, 2015). However there is need for specificity with regards to how such laws will deal with public domain works and open access in order to move Africa into the knowledge economy.

Copyright and Open Access principles are not specimens of parallel dimension even though the two exist as distinct policies but should be reconciled to ensure the balance in protecting interests of stakeholders, for example, authors, publishers and scholars. Publishing in OA platforms benefits scholars since their works gain more recognition, visibility and expanded readership. However profit driven publishers favour business models that restrict access and then profit from controlling access to scholarly communication. Look at the explosion in self-publishing on the web.

Research Methodology

This researcher is premised on qualitative paradigm as evidenced by its phenomenological thrust which seeks to describe phenomenon relating to Open Access in Zimbabwe. Dogan, Henshaw and Ragsdell (2011) states that unlike the positivist paradigm that focuses on measurements, the phenomenological approach places emphasis on social aspects relating to the phenomenon under study. The researchers used the phenomenological approach because of its appropriateness in case studies and its potential to lend itself to researchers of any lived experience studying. The research is premised on the phenomenological philosophy with its thrust towards exploring and description of the Open Access phenomena as it is experienced in the academia (Giorgi 2009).

The research site for the research was the academic libraries. The target population are assistant librarians who are strategically positioned to deal with OA and library consortia activities. Currently, there are (15) fifteen Universities in Zimbabwe. The researchers selected one University in each of the ten provinces of Zimbabwe. Therefore each university is represented by one respondent drawn from the library. The researchers triangulated interviews and experience to collect data to understudy the Open Access phenomenon in

Zimbabwe's academic landscape. The researcher analysed the data qualitatively and made recommendations to policy makers.

Research Objectives

The researchers' objectives were to find answers to the following research questions:

- What is the state of Open Access in Zimbabwe's academic libraries?

- What policies are in place to support OA & ETDs?

- How many academic institutions have developed IRs?

- What is the role of the library consortia in promoting OA&ETDs?

- What needs to be done to strengthen OA& ETDs in Zimbabwe?

Findings and discussion

- The interviews with fifteen (15) assistant librarians indicated that academic libraries in Zimbabwe have established IR's using commercial or free open source software, for example, DSpace and Greenstone. A total of six (6) academic libraries are listed on the OpenDOAR, while 40 per cent are excluded or not listed. Researchers found out that the reason why these institutions were not listed was because either their repositories were still in infant stage of development or they had not yet established one. 80% of the respondents from academic libraries indicated that they had also started publishing in open access journals as a way of commitment to the open access initiatives. However there is still need to educate researchers on the pros and cons of open access, for example, the Directory of Open Access Journals (DOAJ) to distinguish genuine high impact journals from predatory ones. Through IRs, academic libraries are able to generate new e-content and explore opportunities to license their content. The contents of these IRs include local e-content such peer-reviewed articles, conference proceedings, theses and dissertations, technical reports, grey-literature and other formats.
- Nearly all fifteen Universities in Zimbabwe have IRs and ETDs that are operational

- All institutional repositories had ETDs. Figure 1 below shows some statistics of ETDs available in selected university IRS as at 23rd June 2016.
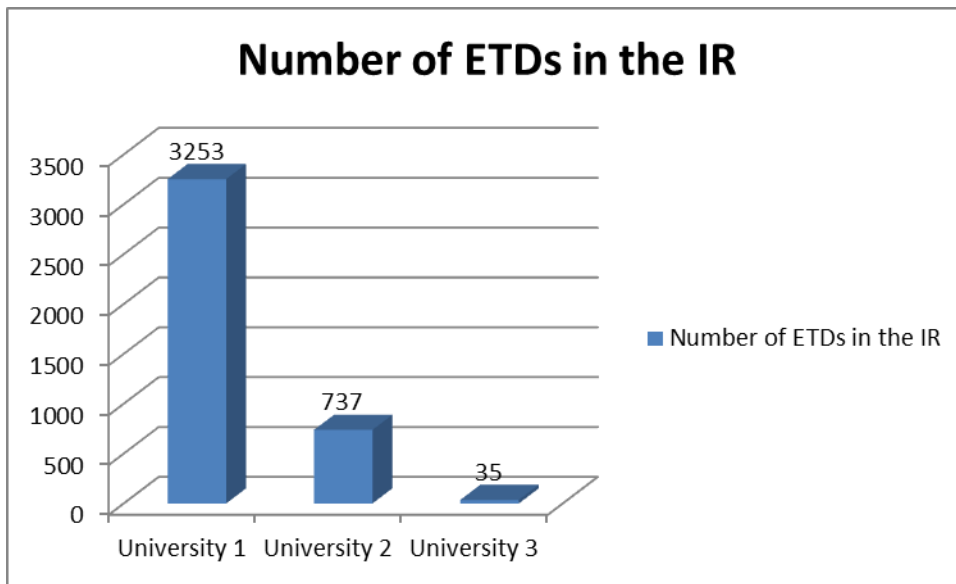

Figure 1: Statistics of ETDs in selected university IRs in Zimbabwe

- The synergy of Open Access and Open Source has helped to develop IRs as evidenced by development of ETDs. The following statistics from one local university which is also a ZULC member indicate the number of downloads for the months of September 2015;

The following webometrics indicate the countries that have accessed and downloaded from ETDs. The country file downloads are;

Country	File download (as @September 2015)
United States	33,890
China	26,614
South Africa	12,344
Zimbabwe	11,567
Germany	6,231

Table 1: Webometric Downloads of ETD from one local University which is member of ZULC

- The interviews also revealed that 100 per cent of the Universities were signatory to OA Policies. The responses indicated that through partnerships with EIFL members of the Zimbabwe University Library Consortium (ZULC) were working towards a national mandate for OA. Responses from interviews indicated that all members of the ZULC observed the OA week in October every year. ZULC also conducts workshops to sensitise stakeholders on the OA Initiative. These workshops have culminated in the commissioning of an OA Policy and resolutions relating to establishment of National Open Access Policy Board and closer cooperation between government, universities, research institutions and librarians.

- Institutional repositories in Zimbabwe have, to a larger extent, grown because they are populated with electronic theses and dissertations. Populating the IRs with ETDs is not difficult considering that university graduates are expected to carry out research will be compiled into research reports / theses & dissertations. It must also be stressed that universities in Zimbabwe have made it requirement that every graduating student should submit a print copy and electronic copy of their dissertation to the library. Libraries then upload the electronic versions of theses & dissertations (ETDs) o their IRs. Many universities have policy frameworks that give the libraries the mandate of collecting theses and dissertations and uploading them on IRs. Open Access policies, intellectual property policies and student ordinances of universities are some typical examples of legal documents enabling libraries in universities collect and manage ETDs using IRs.

- Responses from the interviews indicated that academic libraries have to grapple with issues relating to infrastructural development, access and preservation of ETD content in the advent of technological impermanency. IRs solutions are most viable and sustainable when they are built on open standards. They further indicated that they would build on the strength of OA initiatives and policies currently in place even though they still have to deal with issues relating to standards and protocols for sharing resources.

- ZULC members with Virtual Learning Environments (VLE) should combine this with their IR assets to develop and provide flexible way for reinforcing website, collating a university's research outputs across a particular subject area or period of time and supporting teaching, learning and research.

- These VLEs model or simulate conventional real-world education through integrating a set of equivalent virtual concepts for continuous assessment thus affording students access to web-based access to class content, grades, assessments, and other class tools Open or Access Education Resources (O.A.E.R).

- ZULC has been on the forefront in promoting ETD development and knowledge sharing in all aspects of knowledge work. Cooperation amongst libraries has resulted in economics of scale and widened access to e-resources. Library resource sharing is taking place at a sectoral level but is should transcend to encompass various sectors ranging from public, school, government and religious libraries. It is imperative that ZULC should advocate for the development of a national repository whereby all the universities and affiliates will upload their intellectual output on one platform. Local and international cooperation and collaboration between academic and research libraries under the auspices of the ZULC have been strengthened through INASP and EIFL initiatives to widen access to e-resources.

Recommendations

- IR and ETD infrastructure should be developed to strength knowledge generation and coordination and support teaching, research and learning. Such an investment will ultimately enhance return on investments (ROI) in science, and feed improved economic performance, society and public health through the availability of key data and more productive research;

- Investment in IRs and ETDs and the incorporation of their holdings into the information ecosystem traditionally formed by the library framework will strengthen local capacity to reposition the country on the global science and technology landscape;

- It is critical that to rethink models that are appropriate and sustainable in developing viable and vibrant IRs that provide timeous access to relevant content;

- Adherence to internationally-agreed set of technical standards, for example, Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) will build academic libraries capacity to share resources. IR resources should be shareable, and findable through federated searches. This is important in leveraging and enhancing access to Electronic Theses and Dissertations(ETD);

- The adoption of content/knowledge and document management systems will strengthen the position and role of t academic libraries in information flows. This transition is evidenced by the reconfiguration of library space and architecture into learning and collaborative spaces among members of ZULC;

- It is imperative to take into cognisance number of challenges ranging from , costs, unwillingness by authors to generate content , unclear systems to coordinate , and promote knowledge sharing, lack of support from the top to ensure commitment and sustainability of programme and how to handle rights management issues as well as maintenance of infrastructure to preserve content and preservation of the technology that preserves content;

- There is need for a robust national thrust to coordinate the management and development of ETD repositories with regards to access and preservation. The Database of African Theses and Dissertations (DATA) is a good initiative and it has been in operation for some time. There is need to strengthen this project; and,

- Academic libraries should buttress their existence as ecosystems rather than ego – systems in order to build viable wired and networked platforms for knowledge discovery.

Conclusion

Zimbabwe's academic libraries should strive to use common protocol and standards to interoperability and enhance resource sharing. The challenges that are currently being experienced in the implementation of ETD programmes should be viewed from a historical dialectical and materialistic perspective as an interlude for creativity and innovation. OA platforms should be viewed as opportune technologies to transform the knowledge landscape and move Zimbabwe and other African countries from a imbecile subaltern position to one of a serious and intelligent minded equal partners in re-positioning Africa on the global knowledge economy. It would be folly for knowledge producers to view the OA initiative as an overture for the "dispossession of the already disposed" but rather it's an opportunity to strengthening the standing of academic institutions and quality of African scholarship to widen access. Through OA promotion should utilise webometrics/ infometrics to raise an awareness OA/ETD initiatives. Digital commons should be viewed as an opportunity for carving a new niche for African scholarship and democratic access to scholarly content. It is imperative that all key-stakeholders including government, the

academia , private sector and communities of interest and practice should be consulted in order to make this golden opportunity a reality for the African renaissance in the global knowledge landscape. The ETD revolution signals a progressive dispensation. Globally its implementation and development has not been an easy and free from infallibity because it is a long term process operating in a dynamic and complex environment.ETDs provide an avenue to strengthen science through local open publishing. ETDs are critical in providing academic libraries to create non-elitist and democratic virtual spaces capable of providing students with value adding epistemic experiences irrespective of time and distance.

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