Feasibility of a National Policy on Research Data Management for Higher Education Institutions: A Case of Zimbabwe
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ABSTRACT

Research data management is a vital tool in research and needs policies to be in place that will enable the collection, storage, preservation and access of the data for future development. In order to achieve Zimbabwe’s vision of being a middle-income economy by 2030, development must be driven by researchers and be built from national research repository, which should not only entail research output but also research data. This study was aimed at assessing the need and feasibility of creating a national policy for RDM focusing on the research council of Zimbabwe, librarians from Higher Education Institutions and Ministry of Higher and Tertiary Education as study respondents. The study was carried out in the form of a survey having employed the qualitative research approach. Findings revealed that awareness is not as important as in depth understanding of RDM so as to have smooth formulation and implementation of a national policy, instead stakeholders need to acknowledge the major issues surrounding RDM which include acquiring skills, the legal and technological aspects as they are integral in successful RDM implementation in the HEIs.

Keywords: Higher education institutions, National policy, Research, Research data management,

1.0 INTRODUCTION

Zimbabwe has high literacy levels, people learning from primary to tertiary education (BSs, MSc, MPhil and PhD) where research is being conducted at various academic institutions (Public and Private). Some of the research information is being published, while the other remains unknown. In addition, there is no smooth flow of research outputs amongst the researchers and the academic libraries to foster development from access and utilization of the information. Jones et al (2013) mentions that Higher Education Institutions (HEIs) research data represent available institutional assets which have the potential to be reused beyond the active research phase. Managing research data is an integral part of the research process. It can be challenging particularly when studies involve several researchers and when studies are conducted from multiple locations. Therefore, to fully manage the data it will depend on the types of data involved, how data is collected and stored, and how it is to be used throughout the research lifecycle (Pinfield et al, 2014). Thus, there is a need to consolidate the literacy,
research outputs and human capital to improve livelihoods in Zimbabwe through informed research. This is necessary to find options of creating a platform for easy access to research data from various institutions. In addition, the international community/donors and governments are increasingly advocating for researchers to properly store and share data (Buys and Shaw, 2015) for funding. Corti et al (2011) notes that good data management practice facilitate verification of research results thereby making it easier for the researchers to build on the existing research.

Zimbabwe has the potential to achieve its 2030 vision as set out by the government, but only through collective efforts from all stakeholders including academic institutions and enabling policies. HEIs should be able to share research data as well as outputs to attain the vision 2030 mainly via Research Data Management (RDM). In essence, Whyte and Tedds (2011) say RDM concerns the organization of data, from its entry to the research cycle through to the dissemination and archiving of valuable results. It aims to ensure reliable verification of results, and permits new and innovative research built on existing information. Hickson (2015) noted that researchers were not very forthcoming with their datasets and that mentality needs to be changed. Chigwada et al (2017) mentions that there is no evidence to show how research institutions are managing research data in Zimbabwe although a lot of research activities are being done. The authors of this paper find it prudent to then assess the need for a national policy which will stand as a referral point as well as guide HEIs as to how to undertake RDM services. To avoid one institution being ahead of the other, standardization is necessary. Research, according to the Education 5.0 thrust by the Ministry of Higher and Tertiary Education, Science and Technology Development (MHTESTD) leads to industrialization and innovation, eventually improving livelihoods. Under Education 5.0 this will take the country to the next step closer of attaining Vision 2030 which ideally seeks to make Zimbabwe an upper middle-income economy a standard set by the World Bank entailing higher standards of living, lifting the country from its current state of sanctions-induced de-industrialization and negative growth. Currently the MHTESTD does not have any policy documentation on RDM. Taking into account that RDM has a number of issues involved including skills, technology and infrastructure, the HEIs in Zimbabwe are aware of these as some have most systems in place, most don’t for various reasons to be brought out by this research. Having a national RDM policy can be considered necessary especially in the case of Zimbabwe as it will encourage compliance within the HEIs, if the document is binding, most institutions will adopt the RDM and offer RDM services.

1.2 Research Objective

The study was done with the following research objectives:

1. To find out if the Zimbabwean information custodians are aware of RDM
2. To find out if Zimbabwe has a policy on RDM
3. To identify the need for a policy and the key players in the formulation and implementation

2.0 LITERATURE REVIEW

2.1 Importance of RDM and libraries

Poole (2015) points out that research data sharing through RDM facilitates new theories to be developed and from the accessed information and also helps validate science by reproducing already reported findings. Furthermore, development of knowledge across different fields
depends on how data is analysed and interpreted according to different perspectives (Ou and Zhou, 2016). Generally, researchers are not aware of the importance of preserving datasets for future and also lack the ability to comprehend their data management plans to enable future sharing (Renwick et al., 2017 and Van Loon, 2017). However, scientific laws and innovations are built with researchers tapping on other research within the RDM by fine-tuning what is already existing. University of Twente (2018) notes that good scientific practice is one of the main reasons to manage research data during and archive the data after the project. It goes on to say, it is important to keep available the raw, processed and/or analysed data, as well the documentation necessary for understanding the data and the way it is collected, processed and analysed. The ACRL in its 2016 report highlighted the importance of research data services, data policies and data management plans among the different issues which influence libraries in HEIs. Tripathi et al. (2017) highlights that libraries have always adapted to the changes brought by technologies and have in this context, stepped in to provide RDM services to their researchers.

2.2 Studies done on RDM in Zimbabwe

Nhendodzashe and Pasipamire (2017), posit that developing an RDM service is a noble idea to enable sharing of information but the major challenge was the legal framework and skills lacking within institutions for advocacy. It was also noted that the University of Zimbabwe (UZ) had the two pillars to promote the development of RDM which were Technological infrastructure and finance. Apart from financial costs incurred in upgrading ICT, staff training, particularly the librarians were a major drawback in promoting RDM services at the university of Zimbabwe. Ndhlovu (2016) highlighted that there was low competence in ICT and digital curation among some library staff at the National University of Science and Technology (NUST) yet it is vital for the implementation of the RDM. Chigwada et al. (2017) worked on research institutions in Zimbabwe and indicated lack of support by institutional authorities and researchers negatively affected RDM. It was also noted that authors recommended establishment of research data repositories, and use of already existing research data repositories registered with Research Data Repositories to ensure that research data standards are adhered to when doing research.

2.3 National policy

To avoid fragmentation of research and development there is need for a national policy which will cascade to various institutions in order to develop a sustainable RDM. According to Australian National Database Service, the policy should address ownership of research material, their storage, their retention and appropriate access by a broader research community. Policies are mostly used to provide credentials for those promoting RDM, to gain access to funding for IT infrastructure which will in turn promote RDM. According to Greenbaum and Gerstein (2003), it is important to adopt appropriate technical standards, practices and architecture plus good legal framework to facilitate access to and use of research data, in short that’s the policy. The policy should also entail the need to hire new staff, re-skilling and upgrading of librarians to match the RDM task. The policy will help to stop allegations of research misconduct and assist in protection of intellectual property, reproducibility, replicability and credibility of research.

3.0 METHODOLOGY

Pickard (2013), mentions that research design of a study is the overarching strategy or plan of action that a researcher maps out to perform an empirical inquiry. Creswell (2014) goes on to
say, it’s a plan and procedure that guides the whole research activity from general assumptions to specific methods and tools for data collection, interpretation and analysis. The study was conducted in the form of a survey and employed the qualitative research approach. The study focused on librarians in Higher Education Institutions in Zimbabwe, the research and technology transfer department in the Ministry of Higher and Tertiary Education, Science and Technology Development and a member of the Research Council of Zimbabwe. The aim was to explore the perceptions and understanding of librarians on research data management. Qualitative research approach enables one to study and understand the meanings of one’s feelings, actions and underlying principle of behavior, (Bryman, 2015). A population of 20 respondents was purposively selected by the researchers to include: 2 research directors from Ministry of Higher and Tertiary Education, Science and Technology Development, 1 member from Research Council of Zimbabwe and 17 librarians from different universities (both state and private) around Zimbabwe. The researcher considered it appropriate to select a sample based on the knowledge of the population; informed consent was sought from the participants and identifiable data was anonymised for confidentiality purposes. The study was conducted in April 2019. The questionnaire technique was used for the librarians using online survey; the link to survey monkey was sent where they completed the online questionnaire. The questionnaire gathered information about the librarian’s understanding of research data management and to find out their perceptions on a national policy on research data management.

The interview technique was then used for the directors in research at the ministry of higher and tertiary education, science and technology development as well as research council of Zimbabwe. The interview gathered information as to how the respondents viewed RDM in Zimbabwe as a whole, its significance to attaining vision 2030 and if a national policy could be created towards the RDM movement. Qualitative data within Survey monkey was further analysed using qualitative content analysis. Bryman (2004) describes qualitative content analysis as process of searching-out for underlying themes in materials being analysed. Qualitative content analysis has been defined as, “A research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns” (Hsieh and Shannon, 2005). Qualitative data collected through interviews was analyzed using content analysis methodology which groups data with similar messages together and codes it.

4.0 RESULTS AND DISCUSSION

4.1 Level of awareness, knowledge and utilization of RDM in Zimbabwe

The majority (88 %) of the study sample indicated that there were aware of RDM while 12 % were unaware of the existence of RDM (Figure 1). Those who were unaware of RDM also included 6 % who were not very sure of such a service. Our results show there is a buildup in the last 2 years in terms of awareness of RDM after Chigwada et al , (2017) study who cited over 70% people lacked awareness. Further interrogation on the depth understanding and knowledge of RDM showed that storage/preservation/archiving is a key pillar followed by sharing which had 28 % and 25 % votes respectively. Organising data and creation of the database of the information were ranked at the same level (having 16 % voters) while 3 % only indicated the value of legal and ethical pillars in RDM (Figure 2). Given that three pillars were not identified as major aspects when in fact they are key in smooth running of the RDM indicates that the in-depth knowledge might be lacking from the degree curriculum and might subsequently affect implementation of the policy if implemented. For example, the UK Data
Archive (2015) cited legal, ethical and other obligations as mandatory before advocation and promoting the RDM policy. Furthermore, the variance in understanding of the pillar of RDM contradict with the fact that 88% are aware of the concept and they might be need to educate most of the key stakeholder and the custodians of the RDM. Sixty four percent of the institutions are using RDM while 24% were not using utilizing the service (Figure 3). Such high use of the management systems then confirms the high knowledge base of the concept or can be policies that are forced on by management without analysis their staff capabilities (staff competency audits). High utilization also indicate that institutions acknowledge the value of RDM systems for their students, clients and researchers. However, the benefit of having a localized RDM might not communicate to a large audience thus the need to have a national RDM policy. One key stakeholder mentioned that two institutions (UZ and MUAST) were in the process of merging the IR so that both parties would accrue more benefits but still that not enough if we are to meet vision 2030 of the second republic.

Figure 1. Level of awareness of RDM amongst the study sample in 2019
4.2 Relevance of in economy and research leading to formulation of national policy on RDM with HEI

All the respondents indicated that RDM would play a key role in achieving Zimbabwe’s vision 2030 agenda. This is also confirmed by the fact that the majority of the institutions are playing their small but critical role in implementing RDM. It is recognised that research drives
innovations and development, this study highlighted that RDM would reduce duplication, encourage sharing and reuse of research information as they had the highest ranking to facilitate research with HEI (Table 1). Transparency and safeguarding of information were also other benefit highlighted for higher education research across the country and beyond (Table 1). The Zimbabwean government has identified that research is key in development and a new policy stipulating that 2% of the national budget must be channeled into research was implemented in 2019. In most cases such funding would be channeled through HEI and having an RDM policy would avoid duplication of work and subsequently produce strong taskforce to solve national problems. Some funders can also benefit from the RDM if implemented as they would be able to track and verify authenticity of the research outputs.

This study identified about 15 stakeholders for the formulation of the national policy of RDM. The stakeholders were further grouped into major players (with > 20% votes) including librarians as key (45% votes), ministry of higher education, research council of Zimbabwe while the minor stakeholders had < 15% votes (e.g. industry, ZULC, ICT managers, national archives) (Figure 5). The fact that the librarians were highlighted as the most important stakeholder in formulation of the RDM policy supports the fact that they are custodians and managers of information. However, given that this study used purposive sampling targeting librarians and has shown knowledge fragmentation in some RDM aspects is a challenge. Beside changing the curriculum, some seminar on RDM might have to be done to ensure that the policy formulation and implementation would be smooth. It is important to note that all the mentioned stakeholders are important and they play different roles in ensuring that development is attained by 2030. For instance, research will be done under HEI using money from government via ministry of education while RDM is managed by the librarian and then the industry can utilize the innovation for development. After formulation, about 36% of the respondents indicated that the policy must be enforced or implemented in all the academic institutions while the rest of the pillars had similar 14% votes from the ranking. A logical implementation framework would start with enforcing (step 1) and end up with centrally managed by librarian or research boards (step 5) (Table 2). Enforcing the policy would allow all institutions to take it up and not have the current scenarios where 24% are not using some kind of RDM. At the same time enforcing would drive the same national agenda of developed as set by the government.

Table 1. The importance of RDM in Zimbabwe research and economy

<table>
<thead>
<tr>
<th>RDM Analysis questions</th>
<th>Highlighted themes</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>As key in Zimbabwe’s economy</td>
<td>Very critical</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Very relevant</td>
<td>100%</td>
</tr>
<tr>
<td>As key in Higher Education Research</td>
<td>Avoid duplication of research</td>
<td>56.25%</td>
</tr>
<tr>
<td></td>
<td>Sharing and reuse of information</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Transparency</td>
<td>12.5%</td>
</tr>
<tr>
<td></td>
<td>Safeguarding data</td>
<td>6.25%</td>
</tr>
</tbody>
</table>
Table 2. Building up the framework for RDM implementation within HEI

<table>
<thead>
<tr>
<th>Way forward on RDM policy implementation</th>
<th>Perception Percentage</th>
<th>Steps to be followed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enforcing the Policy once developed</td>
<td>36</td>
<td>1</td>
</tr>
<tr>
<td>Workshops ad trainings on RDM benefits</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>Collaborating and networking amongst institution and researchers</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>Centralised database and catalogue</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Centrally managed by libraries and research boards</td>
<td>14</td>
<td>5</td>
</tr>
</tbody>
</table>

5.0 CONCLUSIONS
This study showed that awareness is not as important as in depth understanding of RDM so as to have smooth formulation and implementation of a national policy. The need to drive research and development was shown to be key for Zimbabwe to achieve its 2030 vision with the utilization of RDM in all HEIs. The study highlighted the need for a national policy and it must be implemented upon development. The development of the policy requires various stakeholders with librarians playing a major role while three major steps (trainings,
collaborations, central database creation) were identified to kick start the formulation process. A national RDM policy that will clearly state how all research data should be preserved for future access is a must to subsequently attain vision 2030 of Zimbabwe and make research more valuable to the nation as a whole.

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